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ABSTRACT

This third special issue of the Health Education Monograph Series on HIV/AIDS Prevention in Rural Communities presents 9 articles on: "Rural Adolescent Views of HIV Prevention: Focus Groups at Two Indiana Rural 4-H Clubs" (William L. Yarber and Stephanie A. Sanders); "Implementing HIV Education: Beyond Curriculum" (Susan Frelick Wooley); "Epidemiological Investigation of Public Knowledge and Attitudes on HIV/AIDS" (Mohammad R. Torabi and Emmanual Ahua); "Health Motivation and HIV Risk Behavior among College Students from Urban and Rural Communities" (Catherine Sherwood-Puzzello); "Strategies for Strengthening Professional Preparation in Support of HIV Prevention and Health Education" (Becky J. Smith and Deborah A. Fortune); "The Relationship of Family Factors to Alcohol Use and Sexual Risk Behavior: Implications for HIV/AIDS Prevention" (Fred Piercy, Joan Jurich, Young Hee Chang, and Mary Beth Stibbins); "Finding Facts: HIV Prevention and Sexual Health" (Debra W. Haffner and Monica Rodriguez); "Relationship of HIV/STD Sexual Risk Behaviors to Other Health Behaviors among a Sample of Indiana Rural Youth" (Richard A. Crosby, William L. Yarber, and Andrew J. Kanu); and "Managing Drug Resistance to Antiretroviral Therapy for HIV Infected Patients" (James G. Anderson, Marilyn M. Anderson, Stephen R. Bryn, Linda L. Casebeer, and Robert E. Kristofco). (Individual articles contain references.) (SM)

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Volume 16, Number 2
1998

The Health Education Monograph

Series

Prevention of HIV/Aids Education In Rural Communities III

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The Health Education Monograph Series

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On
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Foreward

I am delighted to present to you the third special issue of the **Health Education Monograph Series** on *HIV/AIDS Prevention in Rural Communities*.

This publication deals with very timely topics related to HIV/AIDS Education in Rural Communities. The Rural Center for AIDS/STD Prevention is a joint project of Indiana University and Purdue University. This Center provided complete funding for production and distribution of this issue to the entire membership of the National Health Education Honorary. An additional 3,000 copies have been disseminated by the Center. Most of these articles were presented during the Center's Third Annual Meeting held in Bloomington, Indiana in April 1997. Also, some of these studies were funded by the Center. I would like to extend my utmost appreciation to the authors who worked diligently to make this additional publication a reality.

The scope of this special issue is broader and includes other related studies and pedagogical works that were not necessarily sponsored by our Rural Center. Included in this issue are various research and educational projects dealing with different dimensions of HIV/STD prevention in rural communities.

In 1997, new drugs helped to drop AIDS from the number 8 to number 14 leading cause of death on the mortality chart in just one year. According to Health and Human Service Secretary Donna Shalala, this drop means that new treatments have been very effective in extending the lives of people who have already been infected with the HIV virus. But this does not mean we have effectively reduced HIV transmission. This good news holds true only for America and and highly developed nations. Third World Countries, especially some African and Asian nations, have unproportional rates of HIV infected and AIDS cases. Today, these AIDS treatments are neither affordable nor available in the Third World and developing countries.

Obviously, the AIDS epidemic does not recognize any boundaries. It has profoundly effected world communities regardless of gender, age, religion, nationality, ethnicity, sexual orientation, geographic or political boundaries, or socioeconomic status.

The AIDS epidemic has given a new challenge to scientists in all disciplines and accentuates the notion of prevention through education and community empowerments. While some highly urbanized communities received more attention and resources for combating prevalence of HIV/AIDS, the rural communities have been relatively ignored. That is why the incidence of HIV/AIDS infection is growing fast in rural communities. Our Center is practically the only educational and research center that has concentrated its efforts in focusing on prevention of HIV/STD in rural communities.

On behalf of the National Executive Committee of Eta Sigma Gamma, I welcome professional organizations, research, and educational centers to consider sponsoring a special issue of ***The Health Education Monograph Series*** for future publications related to health education. Additional issues will receive full editorial process employed for production of our regular monograph series. As the editor of the Monograph Series and Co-Director of the Rural Center for AIDS/STD Prevention, I am delighted that the Center sponsored the third issue.

I would like to thank Ms. Kathy Finley for her assistance in preparing the publication and Ms. Joyce Arthur for her technical assistance. Also, the assistance of Mr. Jay Javed from our National ESG office is appreciated. Last, but not least, I would like to offer my appreciation to each and every member of the National Executive Committee who are very committed to supporting these monograph series.

Finally, thank you for sharing your comments with me regarding the past Monograph Series. As always, I am eager to hear your criticisms, comments, and suggestions regarding these publications. Your input is essential in improving the publication and ultimately serving our members and the profession in the most effective way. I do hope that you, as loyal members of this National Professional Health Education Honorary, check your college/university libraries and make sure that they receive ***The Health Education Monograph Series***. If not, please request that they subscribe to thiss important publication by calling 1-800-715-2559. It is a privilege for me to serve the Eta Sigma Gamma members and our profession.

I look forward to hearing from you.

Mohammad R. Torabi, PhD,MPH,CHES
Editor, ***The Health Education Monograph Series*** and Co-Director of the Rural Center for AIDS/STD Prevention

The Health Education Monograph Series

Volume 16, Number 2 1998

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Rural Adolescent Views of HIV Prevention: Focus Groups at Two Indiana Rural 4-H Clubs

William L. Yarber, HSD and Stephanie A. Sanders, PhD

This study was funded by the Rural Center for AIDS/STD Prevention, a joint project of Indiana University and Purdue University.

Abstract

This study assessed the views of rural adolescents concerning HIV prevention. Thirty-eight white adolescents (22 females, 16 males), ages 11-17, residing in two southern Indiana counties and members of the local 4-H club were interviewed in December 1996. Standard focus group procedures were used for data collection and analysis (Morgan, 1988), with the theory of planned behavior (Ajzen, 1988) providing the structure for the interview questions. Transcribed responses were synthesized into 56 summary statements that were grouped into eight different categories. Major findings include: a sense of personal invulnerability to HIV was common among both females and males due in part to beliefs that small towns are isolated from HIV; both genders stated that they would not practice sexual abstinence just to avoid HIV; both genders indicated that they would be sexual with another person even if condoms were not available; males stated that they would cooperate with a female partner's request for sexual abstinence, monogamy or condom use; and both genders said that peers and family have the most influence on sexual behavior. HIV prevention education for rural adolescents should strive to eliminate their feeling of invulnerability to HIV infection.

HIV infection and AIDS is an increasingly serious health threat to the adolescents of the United States. The HIV epidemic is shifting to young people (National Institutes of Health, 1997), with one-quarter of all new HIV infections estimated to occur in persons between ages 13 and 20 (Office of National AIDS Policy [ONAP], 1996). Two Americans under the age of 20 become infected with HIV every hour of each day (ONAP, 1996). AIDS was the sixth leading cause of death for young people ages 15-24 in 1995 (National Center for Health Statistics, 1997).

The impact of AIDS in our country is decreasing in urban areas and increasing in rural areas and small communities. Rural AIDS cases rose from 5 percent of the total AIDS cases in 1990 to more than 7 percent of the total cases in 1997 (Belluck, 1998). Further, rural HIV epidemics are considered epidemics of youth (ONAP, 1996; Young, Sandor, Brackin, & Thompson, 1992). Hence, HIV prevention education efforts need to be targeted to rural youth.

A recent collaborative report of the Center for AIDS Prevention Studies and the Harvard AIDS Institute contends that current HIV prevention efforts directed toward young adults are inadequate (Center for AIDS Prevention Studies, 1997). Needs assessment of the target audience is one important strategy in developing effective HIV prevention education. This study assessed the views of rural adolescents concerning HIV prevention.

Methods

Subjects

Subjects were solicited from two 4-H clubs located in two rural (less than 50,000 population), southern Indiana counties. Thirty-eight adolescents (22 females, 16 males) volunteered to be included in the study. The subjects were 11-17 years old and white.

Procedures

The adolescents were interviewed following standard focus group procedures (Morgan, 1988). The focus groups were segregated by gender with the facilitator/interviewer being one of the study's researchers of the same gender. The theory of planned behavior (Ajzen, 1988) provided the structure for the discussion questions, with the questions (see Appendix A) reflecting the theory's major components: attitude toward the behavior, subject norm, and perceived behavioral control. The focus group discussions were tape recorded.

Data Analysis

The responses were transcribed and analyzed. The researchers identified eight thematic categories for grouping points made in the focus groups: rural culture, abstinence, condoms, sexual exclusivity, injecting drug use, pressure/influence, communication, and other. A synthesis of responses resulted in 56 summary statements, reflecting the most important findings. Appendix B contains these summary statements classified by category.

Results

Rural Culture

Both genders reported a sense of isolation from HIV be-

cause they were living in a small town. They stated that people in their community would not fear AIDS until they learned that someone in their town has AIDS. They believed that they would know who to avoid based on reputation and that if someone in their town had AIDS everyone would know. One male said, "You know everybody. You know what they do and what not. They don't have it." Some recognized that a sense of rural isolation from HIV might not reflect the reality of risk. One female said, "I think we're naive. I think we think that we live in a small town, so it's not gonna get here."

The females, in particular, described the importance of reputation in a small town and not wanting to develop an image of "sleeping around." One female said, "Yeah, you could have completely changed. I mean completely changed. You could have been valedictorian of her class and people would still think back, 'Look what she used to be. Know what she used to be?' That's the worst part about around here. People don't forgive or forget."

Abstinence

Subjects stated that they would not abstain from sexual activity with another person just to avoid HIV. One male said, "It's a rural area, people don't think they can get it. The only worry they have is pregnancy." One female said, "They don't fear getting diseases or anything. They just fear getting pregnant because then everybody's gonna know." Pressure from partner and perception that the partner is safe were among the reasons given why it is difficult to refuse sexual activity. Females gave several reasons for abstinence, including fear of pregnancy, moral beliefs and concern for reputation. The females stated that everyone would want to date a male who practices sexual abstinence. Although they felt most males would respect a dating partner's request for abstinence, some believed that some males would leave the relationship. The females also said it was difficult to say "no." The males indicated that they were expected to be sexual with their girlfriends, but most would respect their partners desire to be abstinent. One male said, "I'd say they [males] are pushy, but in the end they are cooperative."

Condoms

Participants indicated that the lack of availability of condoms would not deter them from being sexual with another person. They knew where to get condoms, but felt uncomfortable purchasing them because of the lack of anonymity in a small town. One male said, "...I mean it's a small town. I mean, word gets around, and my mom knows a lot of people." Some males said they stole condoms to avoid embarrassment of interacting with a store clerk. One female stated, "If we can provide a way for people to get condoms without the embarrassment is about the only way because that's why a lot of people don't do it. That's why we've been talking about at our school putting condom machines in the bathrooms." Males noted that they may not insist on condoms use, but that they feel comfortable with using condoms and that they would cooperate with a girlfriend's request to use condoms. The following dialog occurred in one of the male groups: "Well, if the girl's like, 'You're gonna use a condom or you're not gonna get any tonight.'" "Yeah, the guy is like, 'Well, I'll be back in 20 minutes.'"

Sexual Exclusivity

Sexual exclusivity was perceived to be more related to relationship commitment than HIV prevention. Exclusivity was perceived to be normative behavior in relationships, but that alcohol use may lead to sex with another person. One female stated, "And I've heard a lot of people ruined it [sexual exclusivity] because they got drunk and didn't know what happened, and it ended up that they had sex with somebody that they didn't even know and it ruined the relationship that they had with another person." One male said, "Males can be persuaded [to be sexually exclusive]."

Injecting Drug Use

The subjects did not perceive injecting drug use as an issue in their community. One male said, "Most of the drugs around here aren't taken by needles." One female stated, "...most of my friends smoke pot."

Pressure Influence

Peers and friends were identified as having the most influence on sexual behavior, whereas teachers and religious leaders were perceived not to be very influential. One male stated said, "I think if you have a good friend or a couple good friends that tell you to use prevention, I think that you're gonna be more likely to use it [condom] than if you're not going to." One female stated, "It's not like what my pastor tells me, I mean, I'm gonna listen to him. But I'm not gonna totally do everything he tells me to do." Males indicated that they believe that females are more influential in pressuring their peers to practice prevention and that females "break down" quicker than males when pressured to have sex.

Communication

Subjects reported that talking with their partner about sex is difficult, in part because discussion would imply that the partner is HIV infected or has had another partner(s). One female stated, "...the people that are more likely to talk about it are the ones who aren't sure if their partner is fooling around on them or not." One male said, "Well, if you talked about prevention, it would almost be like implying that the other person had STD or HIV."

Other

The risk of pregnancy was reported to be a greater concern than HIV infection, especially for females. Subjects reported that many of their peers talk at school about dating and sex.

with many exaggerating the level of sexual activity. Subjects stated that HIV is not limited to cities and that we would not have this epidemic if people had better morals and discipline, and if public health officials had understood the disease earlier. Subjects gave several suggestions for effective HIV prevention education, such as including "real-life" situations in the curriculum. One female said, "I think junior high school would be the best time to start...because they are immature, but they want to act like they're older." One male stated, "...you gotta make sure that you don't start too young to where it's too early for them to understand." Another male said, "Well, you don't want to scare the kids to death, but, yet you want to get it into their heads."

Discussion

Both the female and male adolescents of this study felt a sense of invulnerability to HIV infection because they did not believe that their own rural town had cases of AIDS or HIV infection. They believed that they know everyone, what they were doing sexually, who they should avoid, and if anyone was infected with HIV or had AIDS. Consequently, they did not worry much about HIV infection and did not practice prevention behavior to specifically avoid HIV. This denial and/or naivete is dangerous because state statistics show that both counties involved in the study have AIDS cases and HIV diagnoses (Indiana State Department of Health, 1996) and because AIDS cases in rural areas represent an increasingly greater proportion of the total AIDS cases (Belluck, 1999). HIV prevention education of rural adolescents should include HIV/AIDS statistics with a focus on HIV prevalence in rural communities. School students could contact the state department of health to discover how many AIDS cases and HIV infected persons are reported in their county.

Evidence of the feeling of invulnerability was revealed in other answers provided by the focus group members. For example, both females and males said they would not practice sexual abstinence just to avoid HIV, and females expressed a greater fear of pregnancy than of HIV infection and a fear of
getting a bad reputation. Both females and males said they would be sexual with another person even if condoms were not available.

These young people felt that a person was either going to be sexually abstinent or was going to engage in sexual activity and not worry about HIV, and that most were choosing the later. For them the decision was about having sex or not. They were simply not worrying about HIV. In order to make the need for HIV prevention practices real, this sense of rural isolation from HIV must be challenged.

Both genders perceived that people in their community would not fear HIV until someone they knew becomes infected with HIV or developed AIDS. Having a local person with HIV/AIDS speak to the local school classes would seem to be a very effective method of helping adolescents understand the reality of AIDS in their own community.

The study indicated that the females may have had more power than they realized in regulating sexual behavior in a relationship. The males said that they would listen and cooperate to their female partners' sexual behavior concerns. For example, while the males said they would not insist on using a condom, they would cooperate if the female wanted to use one, but the female should suggest condom use. The males indicated that they would "push some" for sex, but not to an extreme, and that they would be exclusive to one partner if that was the wish of the female. Thus, consistent with traditional gender roles, males were expected to make sexual advances and females were expected to set the boundaries. But males may be more respectful of females' desires for condom use, sexual exclusivity, and to a lesser extent abstinence, than is commonly believed. The males stated that it was the female's role to initiate discussion about sexual and HIV prevention issues. However, the females indicated that they did not know how to start the discussions.

Abstinence from partnered sexual activity appears to be difficult for these adolescents because of perceived peer norms to be sexually active and because of their own growing desires for relationship intimacy involving sexual activity. This potential advantage to abstinence may be a more persuasive argument for young men inclined to abstain than other fear-based or moralistic messages. Also, it may serve to counter more widespread social norms for young men to "push" for sexual intercourse with their girlfriends. However, it is important to remember that the general consensus was that few would practice abstinence. Therefore, abstinence-only sexuality education may fail many students who are not going to remain abstinent and will need information and skill development to minimize the risk associated with partnered sexual activity.

Educators should inform adolescent females that this research indicates that they have more influence on HIV prevention with their male partners than they may believe, and that the males respected the females' worry about unwanted pregnancy and their reputation. However, the burden for sexual responsibility should not be placed solely on females. Males should be informed that this research indicated that females highly valued males who practiced sexual abstinence and that they all said they would want to do date that person. Also, tell the males that the females indicated that it was difficult for the females to initiate a request for condom use and to acquire condoms. Having students create and role play "opening lines" would assist them to learn how to begin discussion about HIV prevention with a partner. Further, providing students an opportunity to solve problem situations beyond those dealing with discussion of HIV prevention would appear to be valuable.

Both genders indicated that it was embarrassing to get condoms in their town because the store clerk probably knows them or their family. For that reason, some males said that they stole condoms. Students could rehearse verbal scripts

to be used while acquiring condoms and discover where condoms can be purchased in their town or a nearby community for greater anonymity.

Both genders indicated that peers and family have the most influence on their sexual behavior, with teachers and religion not having much influence. This finding reveals the importance of peer education as a valuable HIV prevention education strategy and the need for parent education about how to discuss sexuality and HIV/AIDS issues with their children.

The generalization of the findings are limited given the small number of subjects representing only two rural counties in a Midwestern state and because all of the subjects were white. A similar study at another rural area involving other racial groups may provide different results. However, given the general belief that many rural individuals inaccurately perceive an isolation from the AIDS problem ("HIV Infection & AIDS in Rural America," 1994), one would speculate that most rural adolescents, regardless of location or race, would feel a sense of invulnerability to HIV infection. Eliminating this dangerous perception may be the greatest challenge to rural HIV prevention education specialists.

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Appendix A: Questions Asked to Focus Groups

Attitude

Do teenagers in your community believe that AIDS can be a serious problem in a small town?

Are teenagers in your community afraid of getting HIV?

Would teenagers in your community not have sex if there were a chance of getting HIV?

What are the main reasons why it is difficult for some teenagers in your community to say "no" to sex? ...easy to say "no"?

Why do some teenagers in your community not practice abstinence to avoid HIV?

Do teenagers in your community who have a sexual relationship accept the importance of being monogamous as an important way of avoiding HIV?

What do teenagers in your community think about a teenager who has condoms available for sex?

Do teenagers in your community believe that condoms are effective in preventing HIV infection?

Why do some teenagers in your community not use condoms to avoid HIV?

Do teenagers in your community accept the risk of HIV infection from sharing injecting drug needles?

Subjective norm

Do teenagers in your community want to practice sexual abstinence to avoid HIV?

Do teenagers in your community support their friends who practice abstinence to avoid HIV? ...who practice mutual monogamy? ...who avoid injecting drug use?

Are dating partners in your community cooperative if one of the partners does not want to have sex to avoid HIV?

Do teenagers in your community who become sexually active want to use condoms?

Do teenagers in your community support their friends who use condoms during sex to avoid HIV?

Are dating partners in your community cooperative if one of the partners wants to use a condom for sex to avoid HIV?

Do teenagers in your community pressure their friends to be sexually active? ...to use injecting drug needles?

Perceived behavioral control

Are teenagers in your community strong enough to resist sex to avoid HIV?

Are teenagers in your community who are in a sexual relationship strong enough to practice mutual monogamy to avoid HIV?

Can teenagers in your community resist sex if their partners pressured them to be sexually active?

Are teenagers in your community strong enough to insist that condoms be used during sex to avoid HIV? ...strong

enough to avoid injecting drugs to avoid HIV?

Can teenagers in your community talk to a sex partner about HIV prevention? ...about abstinence, mutual monogamy, condom use? Why or why not?

Would teenagers in your community feel comfortable getting condoms? ...using condoms?

In your community, how much influence do teenagers have on each other to practice HIV prevention? ...influence not to practice prevention? How much influence do parents have on teenagers? ...influence of religious leaders, teachers?

Appendix B: Summary of Responses

Key: AF=adolescent females AM=adolescent males

Rural Culture

A sense of personal invulnerability to HIV was common among both AF and AM, mainly because they believed that small towns are isolated from HIV. They acknowledged that this belief might be naive.

Both AF and AM perceived that people in small towns will not fear HIV until someone they know becomes infected with HIV or develops AIDS. They stated that is someone were infected with HIV everyone would know.

AF indicated the importance of maintaining a good reputation in a small town, and that it is difficult to improve a bad reputation. They indicated that you either have to avoid a bad reputation, ignore it or move away if you have a bad reputation.

Both AF and AM stated that they know everyone in their town, what they do and do not do, and who to avoid.

Both AF and AM indicated that it is embarrassing to get condoms in their town, because the store clerk probably knows them or their family.

Abstinence

Both AF and AM stated that they would not practice sexual abstinence just to avoid HIV.

Both AF and AM indicated that there were different sexual norms for different adolescent social groups, and that for some groups being sexually abstinent can result in being labeled a "prude."

AF suggested that if females want to abstain from partnered sexual activity they should rehearse saying "no" and discuss sex early in the relationship before sexual activity begins.

AF perceived that most males would respect a dating partner's request for sexual abstinence, although some might leave the relationship.

AF expressed respect for a male who practices sexual abstinence and stated that "they'd all want to date him."

AF described reasons why it is difficult to say "no" to sexual activity, such as pressure from partner, being weak, sex happens quickly or is forced, difficulty in discussing sex with partner, and belief that the partner is safe. They indicated that it is easier to say "no" if he brings it up.

Both AF and AM believed it was easier for females to say "no" to sexual activity and that abstinence was more important to females than to males.

AM believed that females are more likely than males to cooperate with a request for sexual abstinence.

AF reported reasons to wait for sex: morals, fear of pregnancy, community standards, what parents and especially others think, and that pregnancy can interfere with achievements of goals.

AF indicated that it takes a strong self-esteem for females to believe they are "worth the wait."

Condoms

AF believed that males carry condoms to "look cool."

Both AF and AM indicated that a female carrying a condom implies that she is "sleeping around."

Both AF and AM stated that they know where to get condoms, but that it is embarrassing to get them.

AM reported that they sometimes stole condoms so they would not have to face the store clerk.

AF stated that they do no know how to initiate discussion about condom use with their partners.

Both AF and AM indicated that they would be sexual with another person even if condoms were not available.

Members of both AF and AM groups disagreed about the prevalence of condom use and the effectiveness of condoms for HIV prevention.

AM stated that females should suggest condom use, and that they are not going to insist on condom use but would cooperate if the female wanted to use condoms.

AM reported that they feel comfortable using condoms.

AF stated that if you are mature enough to have sex you should be mature enough to get condoms.

AF perceived that their community believes that making condoms available to adolescents encourages sexual activity.

Sexual Exclusivity

Both AF and AM indicated that they practice sexual exclusivity as part of a commitment to a relationship, not so much because of worry about HIV infection.

Both AF and AM stated that they assume when sexual activity starts with another person that it will be exclusive.

Both AF and AM stated that alcohol use may lead to "cheating" on a partner.

AM perceived that sexual exclusivity was more important to females, but that they would be receptive to female wishes for exclusivity.

Injecting Drug Use

Both AF and AM do not perceive injecting drug use as a

problem in their communities.

Alcohol use, smoking pot and snorting coke were reported by both groups as more of a problem in their communities than injecting drug use.

Pressure/Influence

AF reported that they looked up to older peers, but were probably naive about their level of sexual activity.

According to both AF and AM, peers and family have more influence on their sexual behavior, with teachers and religious leaders not having much influence.

AM perceived that their male peers do not have much influence on whether they practice HIV prevention, but that females have more effect on each other to practice prevention.

AM perceived that females pressure each other about avoiding a bad reputation.

AM perceived that males are pressured more than females to be sexual and that females "break down quicker" from sexual pressure.

Communication

AF indicated that communication with a dating partner depends on the person, the quality of the relationship, how comfortable the partners are with each other, and if they suspect the partner is "fooling around."

AM believed that females are more likely to talk about sex because they have more at stake.

Embarrassment and implication that the person has HIV are the reasons AM gave for not talking about sex with a dating partner.

AM indicated that they do not often ask about the sexual past of the dating partner since they have a sense of who has been sexually active, although they acknowledge that this perception may be inaccurate.

Other

AF expressed more concern than AM about the negative consequences of sexual activity. They were worried more about unplanned pregnancy than HIV infection.

AF indicated that one reason pregnancy is such an important issues is that it can be easily seen, whereas it is hard to know who is HIV infected.

AM perceived that females are more worried than males about pregnancy.

Both AF and AM indicated that males may not admit their fears of HIV.

AM perceived that many of their peers are sexually experienced and that it is hard for them to resist sex.

AM indicated that they would "push some" for sex with their partner, but not to an extreme. They perceived that it is harder for males to resist sex, that they are expected to "go for it" and that they should brag about having sex.

AF reported reasons to start sex: pressure, because they are in love, heard it was fun, just want to, want relationship to last, it is time to do it, it is the "in" thing to do, you are supposed to, wanting to belong, to avoid embarrassment when the topic comes up, and hard to say that I am waiting.

AM did not express as much concern about their reputation as females expressed.

AF indicated that some of their peers who have a bad reputation "go ahead and live up to it."

Both AF and AM perceived that there is much talk at school about sex on dates, often including bragging and overestimations about the number of peers having sex.

Both AF and AM perceived that HIV prevention education is more effective when someone in the social group has been affected and others know about it, when there is discussion about "real-life" situations, and when the social group leader can be identified and educated to be a good role model.

Both AF and AM disagreed about the best age to initiate HIV prevention education. But, they question whether the education began before junior high school would be effective since "the kids would not know what is going on."

Both AF and AM indicated that education about sexual abstinence and condom use may present a conflicting message.

AM stated that they realize that the HIV epidemic is not just a gay disease and not just limited to cities.

AM indicated that we would not have this epidemic if people, especially gays, had better morals and discipline and if we had figured out this epidemic earlier.

Implementing HIV Education: Beyond Curriculum

Susan Frelick Wooley

After years of denial, many rural communities are becoming aware of their vulnerability to HIV and AIDS. As the number of people with AIDS in the U.S. levels off, so does the distribution of cases. No longer is AIDS primarily an urban problem. Between 1991 and 1997, rates of diagnosed AIDS cases in rural areas increased from 4.9 (Van Sant, 1998) to 8.0 cases per 100,000 (Centers for Disease Control and Prevention [CDC], 1997). Between 1996 and 1997 the number of AIDS cases per 100,000 population was as high in many primarily rural states as in more urban states (Size, 1998).

Adolescents in rural areas differ little in their sexual behaviors from those in other areas [Centers for Disease Control and Prevention (CDC), 1998]. According to data from the 1997 Youth Risk Behavior Survey (YRBS), 48% of high school students in the United States had ever had sexual intercourse, 16% had four or more sexual partners, and 35% were currently sexually active. Among currently sexually active students, 57% reported using a condom the last time they had sexual intercourse, 17% used a birth control pill, and 25% had used alcohol or drugs the last time they had sexual intercourse. Eight percent of high school seniors had been pregnant or gotten someone pregnant. The YRBS also found that over 90% of students received HIV education in school, with percentages lower for minority youth than for whites. The state with the lowest rate (79.9%) is a rural southern state. In the same survey, 63% of high school students said they talked with parents or other adult family members about HIV and AIDS. The states with numbers below 60% included many primarily rural states and territories (CDC, 1998).

Once a community recognizes that its young people are vulnerable to HIV infection or are becoming parents at a young age a call for HIV prevention or sexuality education in schools often follows. Without an understanding of the process of implementing change in schools or of a community's resources for dealing with issues related to HIV and AIDS, such calls often fall on deaf ears or end in failed ventures. This paper presents information about implementing change in schools based on the author's experiences with developing and implementing a national curriculum (BSCS, 1987) and in coordinating a curriculum identification and dissemination project with a federal agency. Within two years of the first national level training for trainers on the second project, school personnel from 51 of 55 eligible states and U.S. territories had received training on at least one identified curriculum. In turn, over 38,000 students throughout the U.S. in both urban and rural areas received instruction on one of the identified curricula during that same two-year period (Wooley, 1996).

Just as changing health-related behaviors of individuals takes time and goes through predictable stages (Prochaska and DiClemente, 1986), introducing a new curriculum into a school takes time and goes through predictable stages. Introducing HIV education, a new curriculum, or a new way of presenting HIV prevention education in a school requires many people to change their behaviors. Effective HIV prevention curricula actively involve students and provide skills training and practice (Kirby, et al., 1994), yet few teachers are adept in teaching social skills. If a new classroom HIV prevention curriculum or series of lessons requires teachers to change not only the content but also the presentation methods they use, then teachers need to develop new skills. They need training, opportunities to practice, and follow up support, just as students need training, practice, and support to develop new social skills.

The people who must change include not only teachers, but also school administrators and decision makers. They determine whether curricular materials are consistent with mandates and community norms, approve funds for materials and training, allocate time for HIV prevention education, place such education within the school curriculum, arrange for training and follow up support, and seek appropriate consent. If a new curriculum involves interacting with community resources, people in community agencies will change how they interact with schools. If a curriculum includes improving family communication among its goals, students' families will change. To meet the needs of teachers who must change, teacher trainers will also have to learn a new program. Ultimately, a new HIV prevention curriculum should result in students changing their behaviors.

CBAM: A Model for Understanding the Process of Change in Schools

Both of these projects drew upon various models of diffusion of innovations as well as experience working with schools. Among the many models for diffusion of innovations, the Concerns-Based Adoption Model (CBAM) describes what happens and also provides direction for implementers (Hall and Hord, 1987). CBAM suggests that people implementing change will have different concerns and needs as they go through the implementation process (see Figure 1). For teachers in a school, the concerns follow a

predictable pattern. Knowing that pattern can help when developing a system for supporting the implementation process. Moving from one level to another in the model requires addressing people's concerns at each level.

Figure 1: Concerns-Based Adoption Model (CBAM)

1. Awareness	5. Consequences
2. Information	6. Collaboration
3. Personal	7. Refocusing
4. Management	

(Based on the work of Hall and Hord, 1987)

Awareness. To understand the CBAM, consider the process a teacher might go through in implementing a new HIV prevention curriculum. As a first step, the teacher must become aware of the new lessons or curriculum. Before a teacher reaches this stage, response to the new materials might be, "I do not know about this" or "I am not interested in this." Moving the teacher from pre-awareness to awareness requires some type of personal contact. A study in the Netherlands, where teachers make curricular decisions, found that most teachers did not actively seek out information about new curricula. They usually became aware of a new curriculum from written materials such as direct mailings sent by publishers or from colleagues who had some experience with the curriculum (Paulussen, Kok, Schaalma, & Parcel, 1995). Some strategies for moving teachers from pre-awareness to awareness are promotional flyers, presentations or exhibits at professional meetings, and staff meetings in schools where teachers share ideas. In rural communities, teachers often have fewer opportunities to interact with teachers from other schools and districts, so opportunities for sharing new ideas might be fewer.

Informational. Once a teacher becomes aware of something new that holds some interest, the next concern is informational: "What do the materials consist of?" "What does the curriculum offer that makes it worthy of consideration?" "What does it cost?" "How much time does it take?" Teachers in rural areas often have concerns about how they might get access to materials for review or whether training will be available at a convenient location. Teachers with these concerns need information about the curriculum. When teachers are at this level, written information about a curriculum or a presentation at a convention or a staff meeting might help satisfy their concerns.

Personal. Next come personal concerns such as "Where will I find the time and energy to prepare for something new?" "What kind of training will I need?" "What is my comfort level with the lesson topics?" When teachers are at this stage, a formal training on the curriculum can help them become familiar with and comfortable with the new materials. If the training offers follow up support and technical assistance, teachers can have some confidence in proceeding, knowing they have help if needed later on.

For sexuality education, concerns about community reactions are often high in rural communities. Potential adopters live and work in the community and realize that discussions of sexual matters can cause controversy. Thus, obtaining administrative, parental, and community support can address personal concerns of both teachers and administrators. If members of the community and representatives of students' families have not been involved prior to this point, they should be involved now. Successful implementers will take time at this stage checking out community and administrative support. Administrators, parents, and others in the community might well be at the pre-awareness level, so before proceeding with teachers, those shepherding the implementation process might need to shift their focus to others. To gain the acceptance and support of students' families, school board members, members of the religious community, and others in the community, implementers must address the informational and personal concerns of these stake holders.

Management. Teachers' next concerns revolve around management issues: "How will I obtain needed support materials?" "What are the phone numbers for local referral services?" "How will I organize the classroom — arrange the desks and chairs to facilitate active student involvement?" "How will I assign students to groups?" "How will I get students reconvened when they are engaged in small group work?" In rural areas, teachers might have concerns about locating local resources needed for the curriculum, such as access to trained adolescents infected with HIV who are willing to speak about their condition. A good training will begin to address some of these concerns, but only when the teacher prepares to teach the materials for the first time will he or she confront all the logistics involved. Having another teacher in the building or a local community resource person can help at this stage. A supportive building administrator is crucial. A regional resource center or district coordinator can provide considerable assistance. Management concerns will continue throughout the first use of a new curriculum. They will reemerge, but to a lesser extent, each time a teacher uses the curriculum.

Consequences. Only when teachers begin to feel comfortable with the flow of lessons and the mechanics of implementation will they wonder about the consequences of the curriculum: "How did the students react?" "Did any parents give feedback?" "Did students take the messages to heart and change in any way?" Consistent with behavioral research, when teachers perceive positive results — students enthusiastic about lessons and participating eagerly, parents thanking them for opening dialogue with their sons and daughters at home — they will gain confidence and become convinced of the value of the curriculum. If, however, teach-

ers experience negative consequences — students who mock the lessons, inability to obtain needed materials or resources in the community, opposition from members of the community, criticism from the school administrator — they will often discontinue use of the materials or modify them to eliminate the problems. If teachers in a remote location find that accessing materials or other resources is time consuming, they might eliminate effective, but time-intensive strategies. If a school or teacher builds evaluation into implementation, the evaluation results can address concerns about consequences, but evaluation results will usually be less compelling than the teacher's gut experience of consequences.

Collaboration. A teacher who is enthusiastic about a new curriculum because of positive experiences with it, will often want to share with colleagues. The teacher might also want to enhance the curriculum by increasing collaboration with community agencies. "How can I get others to use this — it's great!" "Could I get the art teacher to work with the students on the community awareness activity in the curriculum?" "How can I get more parents to participate in the family dialogue activity?" Giving teachers a chance to reconvene at this point can help them address their concerns about collaborating as well as about any personal, management, or consequences concerns they had that are still unresolved. In rural communities, teachers with these concerns often discover the lack of services, especially services for adolescents who have concerns about reproductive health issues including possible HIV infection or who require treatment for AIDS.

Refocusing. Some teachers who continue using a curriculum and become comfortable with it eventually have concerns about refocusing: "How can I take the skills in this curriculum and apply them to other content areas?" "Could my students work with a local AIDS service organization as part of their service learning requirement?" "Could I incorporate new information I learned at a conference into the lesson plans?" "Could I become a trainer and begin teaching other teachers?" Often, no one can provide support for these concerns because these teachers are charting new territory. However, they might begin the entire process anew — to develop new skills and change in new ways. As Gene Hall, one of the developers of CBAM, has said, "The road to suc-cess is always under construction."

Barriers and Facilitators to National Dissemination of Effective HIV Curricula

In 1991, the Centers for Disease Control and Prevention's Division of Adolescent and School Health (CDC/DASH) launched its Research to Classroom project. The purpose of the project was to identify curricula with credible evidence of effectiveness in reducing selected risk behaviors among school aged youth. The project started with curricula intended to reduce behaviors that place youth at risk for HIV infection. In addition, the project recognized the need to ensure that identified materials and accompanying training were available nationally to those interested in adopting the identified curricula (Education Development Center [EDC], 1994).

As the system evolved, CDC conducted formative research on the system itself (EDC, 1994). The formative research revealed that the most frequently reported barriers to implementing curricula with evidence of effectiveness were real or perceived controversy, time constraints, and lack of administrative support. Other frequently mentioned barriers included teachers' personal discomfort with sensitive controversial content, with skills teaching, and with sexuality in general. (Brener, 1995). The School Health Policies and Programs Study (SHPPS) findings that most health teachers lack professional preparation in health education (Collins et al., 1995) might explain some of teachers' discomfort. Another frequently mentioned barrier was how to fit the several hours required for effective HIV education into a school's existing health education offerings. Issues common to those in rural areas included the community wanting abstinence as the only message, denial that HIV presents a problem in rural areas, and lack of resources. In addition, when schools have small staffs and teachers assume many roles, teachers in rural schools often find the prospect of taking on one more task daunting. Furthermore, willing appropriately-prepared teachers and interested students often did not have enough flexibility to find a fit in their schedules. The barriers in this study fit into the CBAM paradigm; most represented personal or management concerns.

CDC's formative research also asked state-level education agency staff what contributed to successful implementation of evaluated HIV prevention curricula. Incentives such as free training, paying for substitutes, providing minigrants to schools, and providing graduate credit for attending trainings ranked first and probably addressed personal and management concerns. The next most frequently mentioned contributor to success was external support from community coalitions, parent groups, health and medical organizations, and individual parents. This support can address not only personal concerns but also concerns about consequences. Internal support from school administrators, school boards, and state mandates was another key factor and it addressed the same concerns. Having building level contacts, regional coordinators, eager teachers, or local advocates also contributed to successful implementation, as did training school teams that included both teachers and school administrators, compared to training teachers who participated as individuals.

Lessons Learned from a Statewide Curriculum Dissemination Project

The findings from CDC/DASH's formative research on its Research to Classroom project are consistent with those of a five-year state-wide effort to diffuse tobacco prevention curricula in North Carolina, funded by the National Cancer Insti-

tute (Smith, Steckler, McCormick, & McLeroy, 1995). Most of the North Carolina schools were in rural areas. The authors condensed what they learned over five years of implementation efforts into specific lessons, which fell into three broad categories – school environment and context, leadership, and training.

School environment and context. Within the school environment and context category, lessons learned included that turbulence, teacher and administrator turn over, as well as school restructuring, hindered implementation efforts of a new health-related initiative. Just because teachers in a school received training one year, one could not assume those same teachers would be at the school or have the same assignments the next year;therefore, schools needed continued availability of training and support. As part of the school's climate, the authors also found that standardized testing in other academic content areas affected implementation of health curricula. When the driving force in a school was to improve test scores in reading and math, health became a low priority. A third environmental influence was whether health topics were part of categorical curricula or infused. Categorical curricula often had financial support as well as external advocates and were thus more attractive to schools than comprehensive health education approaches. Even weaker were curricula that infused health content into o 'ier subject matter, a finding supported by the SHPPS study (Collins, et.al., 1995)

Leadership. The most effective leadership included a health coordinator at the district level and a high level district administrator who championed the effort. In addition, the curriculum needed a teacher or district level liaison (who could be the coordinator) who advocated for it and who provided encouragement and logistical support. This finding is very consistent with CBAM; if teachers can get their personal and management concerns met quickly, they are more likely to use the intervention.

Training. In North Carolina, the most effective implementation occurred when teachers and administrators had opportunities for a series of trainings. Pre and post training consultation also improved results. However, even with training, some teachers did not implement the curriculum. The reasons were either that they lacked administrative support or they felt uncomfortable with the intervention because it did not fit their teaching style – personal concerns. During a project update meeting held December 1991 in Denver, CO as part of a research study on a HIV prevention curriculum, Don Iverson shared that the most effective teachers were those who had received the five-days of training on the curriculum and had previous training in implementing skills-based curricula. The conclusion of the North Carolina study was that providing training and materials did not guarantee long term implementation. Long term change required trained administrators who provided support, teachers or coordinators who provided continuous reinforcement and support, on-going training for new staff, and community support.

Considerations Specific to Rural Areas

Because people in rural areas tend to have a sense of community, the community needs to have a stake in a new HIV prevention curriculum in the school. That support begins with key opinion leaders who have influence directly or indirectly with the school board, with the religious community, and with families of students. Each community has formal and informal leaders who can influence many people. These people need to be aware of what is proposed and support implementation (or at least not oppose it). If objections arise, these are the best spokespeople for diffusing potential controversy.

Effective implementation requires access to training, to materials needed for the curriculum, and to on-going logistical support and encouragement for teachers. In rural areas these can present barriers to implementation. For teachers from rural areas to attend training, they often must travel and be away from home and school responsibilities. Training costs, then, must include travel and substitute pay. Since rural schools often have little extra money, such costs can present barriers. If a few teachers and administrators can receive training away from home, they might be able to provide training for others on site, reducing the cost in time and money.

Sometimes, poorer schools can obtain loaned materials to help with costs. To secure loaned materials, however, teachers in rural areas must usually order them well in advance to allow shipping time. Teachers might need logistical support to arrange for shipping. Accessing follow up support often presents another barrier for those in remote areas. With the Internet and teleconferencing, people in rural areas can sometimes get such support without having to travel long distances.

Another issue common in rural areas is the content of HIV prevention materials. High school students in rural areas often lack access to confidential sources for reproductive health information or services. Buying condoms at the local store where everyone knows them and their parents or entering an STD or HIV testing facility where family members or friends work or might see them presents significant barriers for many young people. Prevention education programs in rural areas need to help sexually active young people get the services they need without usurping the important role of families in their lives.

So, what do you need to get effective HIV prevention education into schools in rural areas?

- An effective curriculum
- Trained teachers
- Sufficient time
- Supportive administrators
- A teacher or district-level staff person who can provide on-going encouragement and support

- Support from the community
- Access to needed materials and follow up consultation
- Access for students to services advocated in the curriculum.

AND patience.

Several resources exist for those wanting more assistance in implementing HIV prevention education in schools. *Educating for Health: A Guide to Implementing a Comprehensive Approach to School Health Education* (Marx & Northrop, 1995) provides information and tools useful for people at the local level. ETR Associates' *Dissemination Workbook* (1997) provides useful information and checklists for those working at a large district, regional, or state level. *Health Is Academic* (Marx & Wooley, 1998) provides guidance for those wanting to implement HIV education in the context of a coordinated school health program. *Building Effective Coalitions to Prevent the Spread of HIV: Planning Considerations* (Allensworth, n.d.), *A Comprehensive Approach to Reduce Pregnancy and the Spread of HIV: An Advocacy Kit* (Allensworth & Rubin, 1997) , and *Thinking Ahead: Preparing for Controversy* (Newman & Farrell, 1991) provide suggestions and tools for building community support. Effective implementation of something new in a school takes three to five years. It takes a team of people who are committed for the long haul. It takes a vision of what can be and flexibility to negotiate the detours on the road that is always under construction.

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Epidemiological Investigation of Public Knowledge and Attitudes on HIV/AIDS

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Introduction

Thus far, the only means of battling the further spread of HIV/AIDS infection is through education and empowerment of communities and individuals. To design an effective HIV/AIDS education, prevention campaign, and curriculum, it is essential to understand the public's level of knowledge, attitude, and practices. Further, public opinion is an important force in formulating public policies and legislative agenda relating to public health issues (Torabi & Crowe, 1995; Torabi, McAllister & Kotecki, 1994). Thus far, few studies examined public knowledge, attitudes, perceptions, and correlates of AIDS (Sweat & Levin, 1995; Peruga & Celentano, 1993; Gallagher & Peterson, 1992; Ornstein, 1992). These studies revealed a lower level of knowledge and poor attitude toward AIDS, especially among certain demographic population. Further, they reported certain inconsistencies between individual knowledge about HIV/AIDS and attitude toward the infection and infected individuals, and pointed out that public education, with regard to HIV/AIDS, has not favored the minority group.

In a public knowledge and attitude study about AIDS among adults in Calcutta (Porter, 1993), it was found that over 30% of the people would not have dinner with or continue to work with an AIDS patient and 5% believed that all AIDS patients should be quarantined. Another public knowledge and attitude study conducted in Ireland (Harkin & Hurley, 1998) indicated a high level of knowledge regarding modes of transmission of HIV. Yet, there was confusion about casual transmission of the infection. However, the level of knowledge, attitude, and practice related to HIV/AIDS varies from community to community. It is important to examine the status of these variables in each community. Thus, this study was designed to investigate the knowledge, attitude, and selected practices among Indiana adults regarding HIV/AIDS.

Methodology

Sample: All residents of the state of Indiana age 18 years and older who live in a household that could be reached by telephone constituted the population of the study. Cross-sectional design using Standard Random Digit Dialing (RDD) methodology (i.e. including all households with one or more telephones, and those with unlisted numbers) was used to randomly generate survey sample households. A respondent was randomly selected to be interviewed at each residential telephone number which was answered. The Indiana University Center for Survey Research in Bloomington, Indiana conducted the interviews. The interview was anonymous and all answers were kept completely confidential. As with all sample surveys, there is the possibility of sampling error. The sampling error does not take into account other possible sources of error that can occur in any public opinion study.

Instrument and Data collection: This study utilized the National Health Interviewer Survey (U.S. Centers for Disease Control and Prevention: National Center for Health Statistics, 1988; 1994). The instrument consisted of 106 questions. Six demograph items regarding age, gender, marital status, education, income, and community setting were added. The purpose of the 106 closed ended questions was to provide population based data on adults' knowledge, attitudes, and action about HIV/AIDS, transmission of HIV, and their experience with HIV antibody testing. The questionnaire was adopted without any modification so that the obtained data could be comparable to the national data.

Data Analyses: The collected data were subjected to descriptive statistics as well as inferential statistical tests including chi-square test, confidence interval, and analysis of variance. A selected portion of the data also were compared to the comparable portion for the National data collected for the United States (U.S. Centers for Disease Control: National Center for Health Statistics, 1994).

Findings

A total number of 832 adults participated in the study and the margin of error for finding of all proportions reported here was about 3.5% for 95% confidence intervals. About 41 percent were males and 59% females. The age distribution was as follows: about 22% were 18 - 29 years; 46% 30 - 49 years and 32% were 50 years and older. About 54% of the participants were married, 16% never married, 16% divorced or separated, 8% were widowed and 6% living with a partner. Over 54% of the participants have had more than 12 years education 37% had a high school diploma and 9% less than 12 years of education. Nearly 70% of the subjects earned income of $25,000 or more, 27% reported less than $25,000, and 3% didn't respond. The sample reasonably represented different regions of the state. About 31% were from cities, 16% from suburban areas, 34% from small towns, and 19% from rural areas.

The subjects were asked if they had ever been tested for

the AIDS virus. About 17% did not answer the question. Of those who answered the question, 39% said "yes" and 61% said "no." The average number of times they had a blood test for AIDS virus was 2.6 times. Of those who have had the blood test, 45% voluntarily had asked for the blood test. About 80% got the results of their blood test, and 20% did not. About 6.5% have had a blood transfusion at any time between 1977 and 1985. Nearly 76% of the adults thought that the present blood supply is safe from transfusions.

The subjects' behaviors with regard to HIV/AIDS risk taking are summarized as follows: about 1% of the participants have taken illegal drugs by needle one or more times since 1987 and 99% had not. More than one percent of the subjects repeated that they have had sex for money or drugs one or more times since 1987. The sexual partners for the ten years reported to be about 50% men only, 38% women only, 10% have not had any sexual partners, and about two percent were men and women.

The subjects were also asked to what extent they thought that using a condom was effective in preventing the AIDS virus through sexual activities. The results are summarized in Figure 1. As Figure 1 shows, only 23% believed that condoms are very effective while 7% believed that condoms are not effective at all.

The respondents were asked about the effectiveness of a monogamous relationship in preventing the HIV/AIDS virus. The results are summarized in Figure 2 which shows about 10% believe that a monogamous relationship is not at all effective and 14% said it is somewhat effective in preventing the virus.

The participants were also asked about their chances of having the AIDS virus. The results are summarized in Figure 3 which shows that about 3% believe that they have a high or medium chance of already having the AIDS virus and about 27% said their chances are low and 70% indicated no chance

of having the virus. The respondents were also asked about their chances of getting the AIDS virus. The results are presented in Figure 4 which shows that about 3.5% indicated their chances are high or medium and yet about 44% indicated that they have a low chance.

The cross tabulation of the selected knowledge, attitude, and action questions by age, gender, education, community, and marital status, along with the results of chi-square test of significance, are presented in Table 1. Table 1 shows the relationships between public action (practices), knowledge, and attitude related to HIV/AIDS by participants' age, gender, level of education, community setting, and marital status. The bold-face numbers indicate that the listed variables

Figure 1.

Using a condom to prevent getting the AIDS virus through sexual activity is:

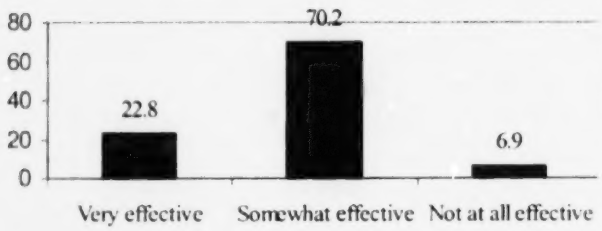

Figure 2.

Using a condom to prevent getting the AIDS virus through sexual activity is:

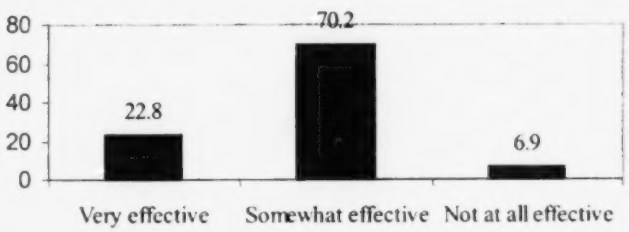

Figure 3.

Your chances of having the AIDS virus are:

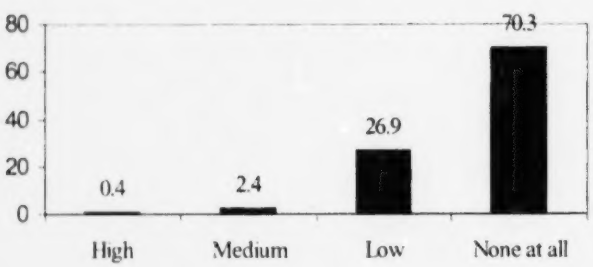

Figure 4.

Your chances of getting the AIDS virus are:

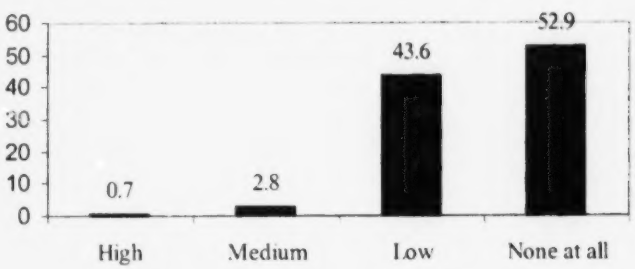

Table 1: Estimates of the percent of responses on public action and public knowledge and attitude from the 1996 Indiana survey, by selected characteristics.

		Age				Gender		Education			Community				Marriage		
	Total	18-29 years	30-44 years	45-64 years	65 or older	Male	Female	Less than 12	12 years	More than 12	City	Sub-urban	Small town	Rural	Married	Never married	Others
Public Action																	
1. In the past month, have you seen public service announcements about AIDS on TV?																	
Yes	*64*	68	68	60	57	62	65	61	67	62	63	63	63	68	62	66	65
No	*36*	32	32	40	43	38	35	39	33	38	37	37	37	32	38	34	35
2. Have you ever read brochures or pamphlets about AIDS?																	
Yes	*71*	**79**	**73**	**66**	**60**	**63**	**76**	**55**	**68**	**75**	74	72	71	63	**68**	**80**	**71**
No	*29*	**21**	**27**	**34**	**40**	**37**	**24**	**45**	**32**	**25**	26	28	29	37	**32**	**20**	**29**
3. Have you ever donated blood?																	
Yes	*44*	39	48	45	40	**51**	**39**	**26**	**37**	**51**	44	49	43	42	**48**	**42**	**37**
No	*56*	61	52	55	60	**49**	**61**	**74**	**63**	**49**	56	51	57	58	**52**	**58**	**63**
4. Have you ever discussed AIDS with children age 10 through 17?																	
Yes	*79*	60	80	82	100	**68**	**87**	87	80	77	76	72	86	78	79	100	80
No	*21*	40	20	18	0	**32**	**13**	13	20	23	24	28	14	22	21	0	20
5. Have you ever discussed AIDS with a friend or relative?																	
Yes	*78*	**82**	**80**	**80**	**64**	**71**	**83**	**62**	**75**	**83**	77	82	77	78	77	79	80
No	*22*	**18**	**20**	**20**	**36**	**29**	**17**	**38**	**25**	**17**	23	18	23	22	23	21	20
6. Have you ever had a talk with a health professional about taking the AIDS virus test?																	
Yes	*24*	**34**	**30**	**14**	**8**	23	25	**18**	**16**	**30**	30	22	24	18	22	27	27
No	*76*	**66**	**70**	**86**	**92**	77	75	**82**	**84**	**70**	70	78	76	82	78	73	73
7. Have you discussed taking the AIDS virus test with a private doctor?																	
Yes	*60*	55	60	62	83	56	62	56	72	56	63	58	64	41	59	45	69
No	*40*	45	40	38	17	44	38	44	28	44	37	42	36	59	40	55	31
8. Have you called an AIDS hotline to discuss taking the AIDS virus test?																	
Yes	*5*	4	9	0	0	8	4	0	3	7	3	8	7	5	4	13	4
No	*95*	96	92	100	100	92	96	100	97	93	97	92	93	95	96	87	96
9. Have you discussed taking the AIDS virus test at a prenatal clinic?																	
Yes	*14*	**26**	**10**	**4**	**0**	**3**	**20**	11	23	11	13	8	14	23	17	10	11
No	*86*	**74**	**90**	**96**	**100**	**97**	**80**	89	77	89	87	92	86	77	83	90	89
10. Have you discussed taking the AIDS virus test at an STD clinic?																	
Yes	*14*	19	11	12	17	16	13	22	10	14	17	16	13	5	**6**	**27**	**19**
No	*86*	81	89	88	83	84	87	78	90	86	83	84	87	95	**94**	**72**	**81**
11. Have you had your blood tested for the AIDS virus infection?																	
Yes	*39*	**53**	**48**	**26**	**13**	42	37	**27**	**32**	**45**	**45**	**43**	**39**	**28**	38	37	44
No	*61*	**47**	**52**	**74**	**87**	58	63	**73**	**68**	**55**	55	**57**	**61**	**72**	62	63	56
12. Was your blood test for AIDS virus infection:																	
Part of a blood donation	*8*	9	6	13	0	4	10	0	9	8	5	5	9	19	**7**	**8**	**10**
Voluntary	*38*	31	43	29	60	32	41	40	36	38	44	50	34	19	**24**	**38**	**59**
Other activities	*54*	60	51	58	40	64	49	60	55	54	51	45	57	62	**69**	**54**	**31**
13. Did you get the results of your test?																	
Yes	*85*	91	85	80	60	84	85	100	75	89	**95**	**90**	**81**	**63**	82	85	88
No	*15*	9	15	20	40	16	15	0	25	11	**5**	**10**	**19**	**37**	18	15	12
14. Were your blood tests for AIDS virus infection part of a blood donation?																	
Yes	*38*	39	37	43	20	**47**	**30**	25	38	40	33	57	35	33	**39**	**55**	**26**
No	*62*	61	63	57	80	**53**	**70**	75	62	60	67	43	65	67	**61**	**45**	**74**

(Numbers in bold-face indicate statistic significance at .05 level on Chi-square tests.)

Table 1: Estimates of the percent of responses on public action and public knowledge and attitude from the 1996 Indiana survey, by selected characteristics (continued).

		Age				Gender		Education			Community				Marriage		
	Total	18-29 years	30-44 years	45-64 years	65 or older	Male	Female	Less than 12	12 years	More than 12	City	Sub-urban	Small town	Rural	Married	Never marrie d	Other s
15. Do you expect to have a blood test for the AIDS virus infection in the next 12 months?																	
Yes	17	**31**	**20**	**8**	**3**	20	15	21	16	18	22	15	17	10	**10**	**37**	**20**
No	83	**69**	**80**	**92**	**97**	80	85	79	84	82	78	85	83	90	**90**	**63**	**80**
16. Will the test be:																	
Part of a blood donation	30	**18**	**39**	**36**	**50**	**37**	**24**	0	29	35	29	31	28	42	**44**	**28**	**18**
Voluntary	49	**67**	**41**	**21**	**0**	**33**	**63**	90	51	41	44	56	54	33	**25**	**57**	**63**
Other activities	21	**15**	**20**	**43**	**50**	**30**	**13**	10	20	24	27	13	18	25	**31**	**15**	**19**
Public Knowledge & Attitude																	
17. Is there a difference between having the AIDS virus and having the disease AIDS?																	
Yes	85	81	85	86	88	85	85	**75**	**83**	**87**	83	86	83	89	84	83	87
No	15	19	15	14	12	15	15	**25**	**17**	**13**	17	14	17	11	16	17	13
18. AIDS can reduce the body's natural protection against disease. Do you believe it is:																	
Definitely true	76	**81**	**81**	**74**	**61**	77	76	**54**	**68**	**85**	76	80	75	75	75	82	75
Probably true	19	**17**	**16**	**21**	**24**	19	18	**28**	**25**	**13**	17	19	20	19	19	15	19
Probably false	2	**1**	**2**	**2**	**5**	2	2	**8**	**2**	**1**	3	1	2	3	3	2	2
Definitely false	3	**1**	**1**	**3**	**10**	2	4	**10**	**5**	**1**	4	0	3	3	3	1	4
19. AIDS is especially common in older people. Do you believe it is:																	
Definitely true	1	0	1	0	1	0	1	1	1	0	0	0	1	0	0	1	1
Probably true	4	3	4	3	6	4	4	7	4	3	3	3	5	6	3	5	4
Probably false	36	39	32	35	45	34	38	31	38	37	33	39	37	39	37	34	36
Definitely false	59	58	63	62	48	62	57	61	57	60	64	58	57	55	60	60	59
20. AIDS can damage the brain. Do you believe it is:																	
Definitely true	12	9	12	13	15	10	13	15	11	12	10	11	12	13	**12**	**6**	**14**
Probably true	38	36	36	38	44	35	40	52	38	35	42	36	38	34	**35**	**40**	**43**
Probably false	38	42	40	37	32	42	36	24	41	39	34	40	39	43	**42**	**40**	**31**
Definitely false	12	13	12	12	9	13	11	9	10	14	14	13	11	10	**11**	**14**	**12**
21. AIDS usually leads to heart disease. Do you believe it is:																	
Definitely true	2	2	2	2	6	3	2	**7**	**3**	**2**	2	0	4	3	2	2	3
Probably true	30	27	32	27	34	25	33	**45**	**32**	**25**	29	27	30	33	31	22	32
Probably false	49	53	48	48	43	50	48	**37**	**48**	**51**	46	55	48	48	48	54	46
Definitely false	19	18	18	23	17	22	17	**11**	**17**	**22**	23	18	18	16	19	22	19
22. AIDS is an infectious disease caused by a virus. Do you believe it is:																	
Definitely true	64	**79**	**72**	**55**	**39**	64	64	**54**	**56**	**71**	66	59	67	60	**62**	**79**	**61**
Probably true	27	**18**	**22**	**32**	**42**	30	25	**28**	**34**	**22**	25	34	25	28	**28**	**18**	**29**
Probably false	4	**2**	**2**	**5**	**11**	3	5	**8**	**4**	**4**	6	2	3	6	**4**	**2**	**6**
Definitely false	5	**1**	**4**	**8**	**8**	3	6	**10**	**6**	**3**	3	5	5	6	**6**	**1**	**4**
23. Teenagers cannot get AIDS. Do you believe it is:																	
Definitely true	2	**0**	**1**	**2**	**6**	**1**	**2**	**8**	**1**	**1**	2	1	2	1	**1**	**0**	**4**
Probably true	1	**0**	**0**	**1**	**5**	**1**	**1**	**4**	**2**	**0**	0	1	1	2	**1**	**2**	**0**
Probably false	1	**0**	**1**	**3**	**2**	**2**	**1**	**1**	**2**	**1**	2	2	2	0	**2**	**0**	**2**
Definitely false	96	**100**	**98**	**94**	**87**	**96**	**96**	**87**	**95**	**98**	96	96	95	97	**96**	**98**	**94**
24. AIDS leads to death. Do you believe it is:																	
Definitely true	70	68	72	71	69	**65**	**74**	**85**	**75**	**64**	70	63	74	70	68	67	77
Probably true	25	24	21	24	26	**26**	**21**	**11**	**20**	**27**	23	30	20	24	25	27	18
Probably false	5	5	6	3	4	**7**	**3**	**1**	**3**	**6**	4	6	4	4	5	5	3
Definitely false	2	3	2	2	1	**2**	**2**	**3**	**2**	**3**	3	1	2	2	2	1	2
25. A person can be infected with the AIDS virus and not have the disease AIDS. Do you believe it is:																	
Definitely true	60	**64**	**65**	**58**	**44**	56	63	**43**	**55**	**66**	61	61	59	58	60	68	56
Probably true	29	**23**	**25**	**33**	**43**	32	27	**42**	**34**	**24**	26	28	30	34	29	21	33
Probably false	6	**8**	**5**	**4**	**9**	5	6	**8**	**5**	**6**	7	5	6	4	5	6	7
Definitely false	5	**5**	**5**	**5**	**4**	7	4	**7**	**6**	**4**	6	6	5	4	6	5	4

(Numbers in bold-face indicate statistic significance at .05 level on Chi-square tests.)

Table 1: Estimates of the percent of responses on public action and public knowledge and attitude from the 1996 Indiana survey, by selected characteristics (continued).

		Age				Gender		Education			Community				Marriage		
	Total	18-29 years	30-44 years	45-64 years	65 or older	Male	Female	Less than 12	12	More than 12	City	Sub-urban	Small town	Rural	Married	Never marrie d	Other s
26. Looking at a person is enough to tell if he or she has the AIDS virus. Do you believe it is:																	
_ Definitely true	*2*	**0**	**1**	**1**	**5**	1	2	**6**	**1**	**1**	2	1	1	1	**1**	**0**	**4**
_ Probably true	*3*	**0**	**2**	**4**	**10**	4	3	**8**	**4**	**2**	2	4	4	4	**4**	**2**	**3**
_ Probably false	*12*	**8**	**8**	**14**	**23**	13	11	**16**	**12**	**10**	11	13	12	12	**11**	**9**	**13**
_ Definitely false	*83*	**92**	**89**	**81**	**62**	82	84	**70**	**83**	**87**	85	82	83	83	**84**	**89**	**80**
27. Any person with the AIDS virus can pass it on to someone else during sexual intercourse. Do you believe it is:																	
_ Definitely true	*84*	89	81	83	82	**79**	**86**	95	83	82	85	80	82	8[illegible]	80	89	86
_ Probably true	*13*	9	15	13	16	**17**	**11**	4	13	15	12	18	14	11	16	8	12
_ Probably false	*2*	2	2	3	1	**3**	**2**	0	2	2	2	1	3	2	3	2	1
_ Definitely false	*1*	0	2	1	1	**1**	**1**	1	2	1	1	1	1	1	1	1	1
28. A person with the AIDS virus can look and feel healthy and well. Do you believe it is:																	
_ Definitely true	*69*	**80**	**75**	**63**	**48**	69	69	**55**	**61**	**76**	71	70	69	65	**68**	**76**	**67**
_ Probably true	*26*	**17**	**22**	**31**	**40**	26	26	**31**	**33**	**21**	25	28	25	28	**28**	**18**	**26**
_ Probably false	*3*	**2**	**2**	**4**	**6**	3	3	**8**	**3**	**2**	2	2	3	5	**4**	**2**	**2**
_ Definitely false	*2*	**1**	**1**	**2**	**6**	2	2	**6**	**3**	**1**	2	0	3	2	**0**	**4**	**5**
29. A pregnant woman with AIDS virus can give the AIDS virus to her baby. Do you believe it is:																	
_ Definitely true	*74*	**76**	**78**	**73**	**61**	**67**	**78**	74	70	76	73	73	75	73	71	79	75
_ Probably true	*24*	**22**	**20**	**26**	**34**	**30**	**20**	25	27	22	24	25	23	26	26	21	22
_ Probably false	*2*	**2**	**2**	**1**	**5**	**3**	**2**	1	3	2	3	2	2	1	3	0	3
30. There is a vaccine available to the public that protects a person from getting the AIDS virus. Do you believe it is:																	
_ Definitely true	*1*	**1**	**0**	**0**	**3**	1	1	**3**	**1**	**1**	1	0	1	1	1	0	2
_ Probably true	*5*	**3**	**3**	**6**	**11**	4	6	**12**	**8**	**2**	5	2	7	4	4	7	5
_ Probably false	*20*	**25**	**16**	**17**	**31**	19	21	**28**	**24**	**16**	24	21	19	15	18	24	23
_ Definitely false	*74*	**71**	**81**	**77**	**55**	76	72	**57**	**67**	**81**	70	77	73	80	77	69	70
31. There is no cure for AIDS at present. Do you believe it is:																	
Definitely true	79	84	83	77	70	76	82	**75**	**76**	**82**	81	83	77	79	77	82	83
_ Probably true	*13*	9	11	16	18	16	11	**9**	**15**	**12**	13	11	15	10	15	12	10
_ Probably false	*2*	2	2	1	2	2	2	**1**	**3**	**2**	2	2	1	3	2	1	2
_ Definitely false	*6*	5	4	6	10	6	5	**15**	**6**	**4**	4	4	7	8	6	5	5
32. A person will get AIDS from working near someone with the AIDS virus. Do you think it is:																	
_ Very likely	*2*	**1**	**1**	**2**	**6**	1	2	**5**	**2**	**1**	1	2	2	3	2	1	2
_ Somewhat likely	*9*	**10**	**8**	**6**	**15**	8	10	**17**	**12**	**6**	9	5	11	9	9	10	8
_ Somewhat unlikely	*16*	**16**	**17**	**15**	**15**	19	14	**22**	**19**	**13**	16	18	16	15	16	17	15
_ Very unlikely	*42*	**39**	**42**	**44**	**44**	43	42	**26**	**40**	**47**	42	46	42	41	44	43	40
_ Definitely not possible	*31*	**34**	**32**	**33**	**20**	29	32	**30**	**27**	**33**	32	29	29	32	29	29	35
33. A person will get AIDS infection from eating in a restaurant where the cook has the AIDS virus. Do you think it is:																	
_ Very likely	*5*	4	3	5	8	4	5	**13**	**5**	**3**	6	3	3	6	3	8	5
_ Somewhat likely	*16*	15	16	17	19	17	15	**19**	**21**	**13**	14	11	17	23	16	18	17
_ Somewhat unlikely	*23*	22	25	19	26	23	23	**20**	**27**	**20**	25	25	21	19	24	19	24
_ Very unlikely	*40*	42	37	41	40	43	38	**29**	**34**	**45**	40	44	39	38	41	40	37
_ Definitely not possible	*16*	17	19	18	7	13	19	**17**	**13**	**19**	15	17	20	14	16	15	17
34. A person will get AIDS infection from kissing, with exchange of saliva, someone who has the AIDS virus. Do you think it is:																	
Very likely	*23*	**9**	**20**	**32**	**34**	22	23	**30**	**26**	**19**	23	22	23	20	**25**	**12**	**23**
_ Somewhat likely	*26*	**19**	**28**	**26**	**33**	30	24	**29**	**30**	**24**	27	21	25	34	**28**	**24**	**26**
_ Somewhat unlikely	*20*	**27**	**23**	**12**	**17**	21	20	**16**	**19**	**22**	16	26	24	16	**20**	**26**	**18**
_ Very unlikely	*22*	**28**	**20**	**22**	**14**	20	23	**14**	**17**	**26**	24	21	21	19	**20**	**29**	**21**
_ Definitely not possible	*9*	**17**	**8**	**8**	**2**	7	10	**11**	**8**	**9**	10	10	7	11	**7**	**9**	**12**
35. A person will get AIDS infection from shaking hands, touching, or kissing on the cheek with someone who has the AIDS virus. Do you think it is:																	
_ Very likely	*1*	**0**	**1**	**1**	**3**	**1**	**2**	**4**	**2**	**0**	0	1	3	0	1	1	2
_ Somewhat likely	*3*	**2**	**3**	**2**	**4**	**3**	**2**	**6**	**4**	**2**	4	2	2	3	3	5	2
_ Somewhat unlikely	*13*	**9**	**15**	**11**	**17**	**17**	**10**	**8**	**14**	**13**	13	13	11	15	14	16	9
_ Very unlikely	*35*	**27**	**34**	**47**	**47**	**41**	**36**	**35**	**41**	**36**	33	43	38	42	39	32	39
Definitely not possible	*45*	**62**	**47**	**39**	**29**	**38**	**50**	**47**	**39**	**49**	50	41	46	40	43	46	48

(Numbers in bold-face indicate statistic significance at .05 level on Chi-square tests.)

Table 1: Estimates of the percent of responses on public action and public knowledge and attitude from the 1996 Indiana survey, by selected characteristics (continued).

	Total	Age: 18-29 years	Age: 30-44 years	Age: 45-64 years	Age: 65 or older	Gender: Male	Gender: Female	Education: Less than 12	Education: 12 years	Education: More than 12	Community: City	Community: Sub-urban	Community: Small town	Community: Rural	Marriage: Married	Marriage: Never married	Marriage: Others
36. A person will get AIDS infection from using public toilets. Do you think it is:																	
_ Very likely	*4*	**3**	**4**	**5**	**4**	**3**	**5**	**7**	**6**	**3**	4	2	5	3	4	2	5
_ Somewhat likely	*11*	**11**	**8**	**10**	**17**	**8**	**12**	**18**	**14**	**7**	10	7	12	12	8	13	13
_ Somewhat unlikely	*16*	**15**	**17**	**15**	**19**	**19**	**15**	**17**	**21**	**13**	17	21	15	14	17	16	15
_ Very unlikely	*36*	**33**	**34**	**37**	**44**	**40**	**33**	**31**	**34**	**38**	31	35	36	44	38	35	33
_ Definitely not possible	*33*	**38**	**37**	**33**	**16**	**30**	**35**	**27**	**25**	**39**	38	35	32	27	33	34	34
37. A person will get AIDS infection from sharing needles for drug use with someone who has the AIDS virus. Do you think it is:																	
_ Very likely	97	98	98	96	95	96	98	96	97	97	96	97	98	96	97	97	97
_ Somewhat likely	*3*	2	2	4	5	4	2	4	3	3	4	3	2	4	3	3	3
38. A person will get AIDS infection from being coughed on or sneezed on by someone with the AIDS virus. Do you think it is:																	
_ Very likely	*6*	**2**	**5**	**5**	**17**	**3**	**8**	**15**	**8**	**3**	8	1	7	5	**5**	**3**	**10**
_ Somewhat likely	*20*	**13**	**19**	**26**	**25**	**23**	**18**	**21**	**23**	**19**	20	20	17	28	**23**	**16**	**18**
_ Somewhat unlikely	*20*	**21**	**21**	**18**	**19**	**22**	**19**	**17**	**23**	**19**	17	20	22	20	**21**	**20**	**18**
_ Very unlikely	*37*	**35**	**37**	**38**	**34**	**36**	**37**	**35**	**32**	**39**	36	43	34	36	**36**	**37**	**36**
_ Definitely not possible	*17*	**29**	**18**	**13**	**5**	**16**	**18**	**12**	**14**	**20**	19	16	20	11	**15**	**24**	**18**
39. A person will get AIDS infection from attending school with someone who has the AIDS virus. Do you think it is:																	
_ Very likely	*2*	**2**	**2**	**0**	**5**	**1**	**2**	**7**	**2**	**1**	1	1	3	3	1	2	3
_ Somewhat likely	*3*	**1**	**2**	**4**	**6**	**2**	**4**	**14**	**1**	**2**	3	2	2	3	2	2	5
_ Somewhat unlikely	*11*	**6**	**12**	**10**	**15**	**14**	**8**	**12**	**15**	**8**	11	9	12	10	12	10	9
_ Very unlikely	*39*	**31**	**38**	**40**	**54**	**41**	**38**	**32**	**41**	**40**	33	44	40	44	40	35	41
_ Definitely not possible	*45*	**60**	**46**	**46**	**20**	**42**	**48**	**35**	**41**	**49**	52	44	43	40	45	51	42
40. A person will get AIDS infection from mosquitoes or other insects. Do you think it is:																	
_ Very likely	*8*	9	8	6	10	7	8	**15**	**11**	**4**	8	2	11	8	8	4	10
_ Somewhat likely	*19*	19	22	18	14	19	19	**28**	**21**	**17**	20	18	18	20	19	23	18
_ Somewhat unlikely	*16*	16	15	16	15	15	16	**18**	**16**	**14**	13	17	16	18	16	16	14
_ Very unlikely	*34*	37	30	33	41	37	32	**24**	**33**	**37**	34	36	32	36	33	37	34
_ Definitely not possible	*23*	19	25	27	20	22	25	**15**	**19**	**28**	25	27	23	18	24	20	24
41. Have you ever heard of a blood test that can detect the AIDS virus infection?																	
_ Yes	*84*	**86**	**90**	**84**	**65**	82	85	**65**	**80**	**90**	83	90	84	80	84	87	82
_ No	*16*	**14**	**10**	**16**	**35**	18	15	**35**	**20**	**10**	17	10	16	20	16	13	18
42. To the best of your knowledge, are blood donations routinely tested now for the AIDS virus infection?																	
_ Yes	96	96	97	96	92	95	97	94	95	96	96	97	96	94	97	96	94
_ No	*4*	4	3	4	8	5	3	6	5	4	4	3	4	6	3	4	6
43. Do you think the present supply of blood is safe for transfusions?																	
_ Yes	76	82	74	76	71	**80**	**73**	**51**	**74**	**81**	**75**	**87**	**72**	**76**	**78**	**79**	**70**
_ No	*24*	18	26	24	29	**20**	**27**	**49**	**26**	**19**	**25**	**13**	**28**	**24**	**22**	**21**	**30**
44. A woman uses a diaphragm to prevent getting the AIDS virus through sexual activity. Do you think it is:																	
_ Very effective	*2*	**0**	**1**	**3**	**2**	**2**	**1**	3	2	1	1	5	2	0	1	1	2
_ Somewhat effective	*19*	**22**	**15**	**18**	**29**	**23**	**17**	29	19	18	18	18	22	18	17	25	21
_ Not at all effective	*79*	**78**	**84**	**79**	**69**	**75**	**82**	68	79	81	81	77	76	82	82	74	77

(Numbers in bold-face indicate statistic significance at .05 level on Chi-square tests.)

Table 2. Demographic Characteristics of the National and The State of Indiana Samples.

		National Percentage (n=20974)	Indiana Percentage (n=829)
Age	18 - 29	22.3	21.8
	30 - 49	41.6	46.1
	50 and over	36.1	32.1
Education	< 12 years	20.7	9.0
	12 years	36.6	36.6
	> 12 years	42.7	54.4
Gender	Males	42.5	41.3
	Females	57.5	58.7

are statistically significant at .05 by chi-square test. This table format is consistent with the Health Statistics Report of the National Center for Health Statistics with the following exceptions. In this article, the variables on community setting and marital status have been added, along with statistical tests of significance. Due to space limitations and self explanatory nature of the table, it is not feasible to discuss every item in Table 1 here. However, few of the important items are summarized as follows.

Question number 11, which is whether or not they have had a blood test for the AIDS virus infection, was statistically related to age, education, community setting, and marital status. In other words, the younger, the more educated, from larger cities, and single people were more likely to have had their blood tested for the infection. With regard to question number 13, people from larger cities and single were more likely to get the results of their blood tests. As expected, question number 17 was statistically related to the participants' level of education. Those with higher educational backgrounds were more likely to know that there is a difference between having the AIDS virus and having the disease of AIDS.

Question 22 states that "AIDS is an infectious disease caused by a virus." This variable was statistically related to age, education, and marital status. Again, younger, more educated, and married people were more likely to believe that statement is definitely true. Overall, 65% of the subjects definitely believe that AIDS is an infectious disease caused by a virus.

With regard to question number 25, 60% believe that "a person can be infected with the AIDS virus and not have the disease AIDS" is definitely true. About 21% think it is very likely or somewhat likely that a person will get AIDS infection from eating in a restaurant where the cook has the AIDS virus (question 33). The question number 36 stating that a person will get AIDS infection from using public toilets was statistically related to the subjects age, gender, and level of education. In other words, older, female, and less educated subjects were more likely to think that a person will get AIDS infection from using public toilets. Overall, about 15% think the above statement is very likely or somewhat likely.

With regard to question number 41, have you ever heard of a blood test that can detect the AIDS virus infection, 16% responded "no." This statement was statistically related to age, education, and again, older, and less educated were more likely to be uninformed of the availability of the AIDS test. About 24% do not think that the present supply of blood is safe. Males, more educated, from city and suburban communities, and married people were more likely to think that the supply of blood is safe for transfusions. Finally, as Table 1 shows, about 21% think that if "a woman uses a diaphragm to prevent getting the AIDS virus through sexual activities" it is very effective or somewhat effective.

Comparison with National Data: Recognizing the time difference between the national data regarding AIDS knowledge and attitude (National Center for Health Statistics, 1994) and this survey, it still may be useful to compare selected variables between the state of Indiana and the national data. The demographic comparison is presented in Table 2.

As Table 2 shows, the percentage distribution for both groups with regard to age and gender is reasonably similar. The subjects' distribution by education is somewhat different.

Knowledge comparison between the two groups with regard to public awareness campaigns about AIDS on television was examined. Table 3 shows the comparison on how much the two groups knew about AIDS, and whether they had seen or heard announcements about AIDS on television. Chi-square test showed significant statistical differences from their responses

Table 3. Comparison of Knowledge and Awareness of Public Campaigns

	Indiana	*National*	Chi-square
How much would you say you know about AIDS			
A lot	19%	26 %	87.42*
Somewhat	58	45	
A little	21	21	
Nothing	2	7	
Seen Announcements about AIDS on television	Yes 64 No 36	Yes 86 No 14	286.74*
Heard announcements about AIDS on television	Yes 27 No 73	Yes 51 No 49	179.58*

(see Table 3). When looking at the question as to how much the subjects know about AIDS, 26% of the national subjects and 19% of Indiana subjects indicated they knew a lot, but the overall majority differed significantly by indicating that they knew "somewhat" to "a little." Table 3 also shows that higher percentages of the public at the national level had seen or heard announcements about AIDS on television than their Indiana counterpart. These differences are statistically significant.

The groups' knowledge and attitudes related to mode of transmission of AIDS HIV were also compared. When asked about the use of condoms to prevent getting the AIDS virus, both samples differed significantly ($p < .05$) in their responses. A low percentage of the subjects from both groups (23% vs 27%) thought condoms were very effective, but the gap between the majority (70% vs 55%) was noticeable by the indication that condoms were somewhat effective in preventing the contraction of the AIDS virus. Even with such a response, both groups thought their chances of having the AIDS virus were low to none. They differed, however, in the expression about the chances of actually getting the virus. The national subjects had a slightly higher percentage response than Indiana subjects (66% vs 35%) in this category. In the investigation of the subjects' attitude towards contracting the AIDS/AIDS virus, comparisons were made of the subjects' likelihood of getting the disease under different conditions of everyday life. Again, using Chi-square analysis, there were observable significant differences ($p < .05$) between the groups. Both differed over the expression that it was somewhat unlikely to very unlikely for a person to get AIDS or AIDS infection working near someone with the AIDS virus, and eating in a restaurant where the cook has the virus ($p < .05$). Indiana subjects were less definite (31% vs 38%) than the national subjects about contracting the disease this way. With regards to getting the HIV/AIDS virus from using public toilets, a lower percentage of the national subjects thought it was definitely not possible (28% vs 33%) than Indiana subjects. The majority of individuals from both groups were more confident of themselves as they indicated in identical responses that this mode of disease transmission was somewhat unlikely to very unlikely. When looked at sharing of plates, forks, or glasses with someone who has the AIDS virus, Indiana subjects were more positive than the national subjects ($p < .05$) in the expression that it was some what unlikely to very unlikely to get the HIV/AIDS virus this way. The subjects also differed in their beliefs that it was somewhat unlikely for mosquitoes or other insects to transmit the disease. Further, they thought it was very unlikely for one to get the infection if one was coughed or sneezed on by someone who has the AIDS virus ($p = 0.05$). There was a split in the response as to whether attending school with a person who has the AIDS virus is a likely way for getting HIV/AIDS virus; however, Indiana subjects had a stronger belief than the national subjects (45% vs 38%). The groups also differed in their response ($p < 0.05$) that it was very unlikely to get the disease attending school with a person with the AIDS virus (47% vs 39%). Except for some minor differences, the majority of the subjects from both groups thought it was very unlikely that people can get the HIV/AIDS virus from mosquitoes or other insects.

Discussion and Recommendations

The study revealed considerable misunderstanding, misconception, and lack of knowledge about HIV/AIDS prevention among adult residents of Indiana. For instance, still about 15% of the public did not differentiate between having the AIDS virus and having the disease AIDS. Only about

76% of the public believed that AIDS can definitely reduce the body's natural immunity against defense. Again, only 64% definitely believed that AIDS is an infectious disease caused by a virus. Still, about 5% of the public believed that looking at a person is enough to tell if he or she has the AIDS virus. About 8% believed that there is a cure for AIDS. About 11% believed that a person will get AIDS from working near someone with the AIDS virus. Approximately 16% have not heard of a blood test that can detect the AIDS virus. Nearly 24% did not believe that the present supply of blood is safe for transfusions. These simple facts clearly indicate a serious need for HIV/AIDS education throughout the state. Based on Table 1, one can make the following conclusion. Generally speaking, younger, female, single, highly educated, and urban groups were more knowledgeable and had more positive attitudes toward HIV/AIDS prevention.

Subjects from both the state and national groups (U.S. Centers for Disease Control Prevention, 1994) were generally familiar with the HIV/AIDS virus at about the same level; the gap in knowledge differences between the groups was profoundly in favor of the national subjects since they showed a higher level of awareness and also believed certain statements to be true more than false concerning HIV/AIDS infection, including the mode of transmission. However, this can be attributable to several reasons including the time difference, the unequal number of subject representation, and the possibility that the national subjects may have a higher information exposure relative to the HIV/AIDS virus than Indiana subjects. This was not necessarily the focus of the investigation. This is consistent with the argument that a wider exposure may have been responsible for the difference. Among the most important findings were responses relating to the fact that AIDS is caused by a virus, and that AIDS can damage the brain. Respondents from both groups also knew on a higher level that one can be infected and not have the disease, and there is no cure for AIDS at the moment.

In order for preventive efforts to have reached a large number of the population, messages would have been received through different advertisement media as evidenced in the responses by the participants. This is particularly significant because the deadly nature of the disease is a very important public health issue and public awareness cannot be overemphasized. We should note that every state in the nation has a different approach and commitment to issues regarding the HIV/AIDS virus; therefore, the differences in public knowledge and attitude within any given state may be dependent on general educational efforts and public awareness as well as the availability of prevention programs supported by unrelenting commitment of both state and local governments to addressing critical issues regarding the HIV/AIDS virus.

With regards to attitude, the study population had different responses to items relating to the questions investigated. These had to do with the likelihood of AIDS infection contraction within the public arena. Fewer subjects from Indiana thought that working with someone with AIDS is a likely way through which a person can get the AIDS infection. Conversely, the majority of the respondents thought it was somewhat unlikely, but definitely not possible, to contract the HIV/AIDS virus from eating in a restaurant where the cook has the AIDS virus; neither was it possible to contract the infection from sharing of plates and glasses nor from the use of public toilets. Nearly all of the subjects indicated it was very likely to get the infection by sharing needles for drug use with someone who has the AIDS virus. These findings are significant because although there may have been differences in the general knowledge and attitudes about AIDS and the AIDS virus, the subjects knew that casual association is not a mode of transmission for AIDS. This important element cannot be overlooked because knowing the mode of transmission of any disease is a focal-point for its prevention. The more the general public is aware of HIV/AIDS virus transmission, the more effective preventive efforts may be.

The difference in responses from Indiana and the national data concerning the effectiveness of condom use and personal vulnerability to the AIDS virus is striking. It is evident that while there is public awareness about AIDS in the media, there is also the need for public education about the use and effectiveness of the condom. This includes availability and accessibility to programs that teach skill development, the correct method for condom use, and the proper technique of use. There is evidence from this investigation that continuous education about the HIV/AIDS virus is still a critical factor in the control and containment of the disease. The general public needs health educators more intensively in every state in the nation, particularly from those that share conservative views about the use of condoms. It appears there is some lack of clarity among Indiana subjects as to how much they know about AIDS. Whereas, they present affirmative responses to most questions under inquiry, the lack of high percentage of definitive responses to issues such as personal vulnerability to AIDS means that the state could be a step behind in public education about AIDS infection.

This investigation presents the need for consistency of public awareness campaigns against AIDS regardless of moral and ideological beliefs of individual states in the nation. Only then can the public distinguish between what is fact or fiction regarding the contraction of AIDS. Secondly, the expansion of educational campaigns through the print and electronic media is necessary. In some locations of the public sector, there may only be one effective way of reaching a large segment of the population such as through newspapers and other dailies. Those avenues should be explored as possible ways of education and investigation of knowledge, attitudes, and practice with regard to the prevention of the HIV/AIDS virus. Perhaps such endeavors would not disregard the sensitivity of the subject within communities, but the message content should be factual enough to close the gap between what is fact and how much people know about AIDS on a general basis.

The findings of the study suggest the following

recommendations:

1. To design effective educational intervention, it is important that public knowledge, attitude, and practices be systematically investigated.
2. To monitor progress and establish any trends in public awareness with regard to HIV/AIDS prevention in the State, this epidemiological study should be replicated about every two years.
3. Specific misunderstanding and misconception and any myth related to prevention, mode of transmission, and HIV blood testing should be taken into consideration in any public education campaign. It is critically important that the public be fully informed with facts so they can protect themselves and their communities from further spread of the infection.
4. While this study revealed specific information about public knowledge, attitude, and action related to HIV/AIDS prevention, we lack similar data from most vulnerable target populations, namely adolescents and young adults. Consequently, it is important that we also consider studying routinely this group's knowledge, attitude, and practices on HIV/AIDS prevention.

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Health Motivation and HIV Risk Behavior Among College Students From Urban and Rural Communities

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Introduction

The year 1981 marked the onset of the human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) epidemic in the United States (Rathus & Boughn, 1994). Initially, the epidemic was isolated among young homosexual men and individuals who shared needles for injecting drugs. Today, the incidences of HIV infection and AIDS are growing more among women, teenagers, and children. Without medical technology available to prevent the acquisition and transmission of HIV infection, prevention education is an important method available to stop this disease from affecting more people. By introducing the facts about HIV/AIDS, educators present basic information for individuals. Nonetheless, educational programs may need to include theoretical components that can help educators understand their target population's motivation behind HIV-risk behaviors and thus develop appropriate prevention programs. This study utilized the Health Motivation Model to determine the motivational factors that affect college students toward HIV prevention and how this information can be used in HIV/AIDS educational programs. By 1992, HIV infection had become the sixth leading cause of death in young people (Hein, 1992). In 1993, it was reported that one in five of all reported cases of AIDS was among the 30-39 year age group (Centers for Disease Control and Prevention [CDC], 1993). As the infection rate continued to increase, the Centers for Disease Control and Prevention (1995a) reported in 1995 that HIV disease was the leading cause of death among people 25-44 years of age. Currently, men having sex with men continues to be the leading transmission mode and the number of people most infected with AIDS are between the ages of 30 and 39 (CDC, 1997).

It is estimated that one in 500 college students is infected with HIV and one in four new infections occurs in people under age twenty-two (Douglas, Warren, Kahn, & Collins, 1995). HIV has had an impact on this population because it is during the period of adolescence that HIV-risk related sexual and drug activities begin (Hein, 1987). Since HIV cannot be detected immediately, HIV continues to spread among adolescents and young adults. Therefore, many HIV infected adolescents and young adults are unaware of their HIV positive status and are likely to continue to transmit the virus unknowingly to other sexual and/or injecting drug partners (Hein, 1991). AIDS has become, and will continue to be, a leading killer of young people in the United States.

Since there is a continued concern with the growing number of young adults acquiring HIV infection, research needs to focus on why this group continues to be a high risk population. During the early years of the AIDS epidemic, researchers explored a number of avenues to help explain why young adults are a vulnerable population to HIV infection. Numerous studies were conducted to assess the level of knowledge, attitudes, and behaviors of young adults (Baldwin & Baldwin, 1988; DiClemente, Forrest & Mickler, 1990; Fisher & Misovich, 1990; Mickler, 1993). Based on the findings of these research projects, innovative curricula were developed in order to educate young adults about HIV/AIDS with the goal of limiting the number of young adults becoming infected.

Petosa and Jackson (1991) utilized the Health Belief Model (HBM) to predict safer sex intentions among adolescents, from which they concluded that educational programs to support safer sex intentions should focus on health-related motivations among young students. They further contended that with older adolescents it may be more effective to expand educational efforts to address factors directly related to their motivational schema and environment. It has been found through literature reviews by Fisher and Fisher (1992) that interventions focusing on information and motivation seemed most likely to have a positive effect on AIDS-preventive behavior. Therefore, determining the motivational factors that may assist in preventing HIV among young adults is essential (Petosa & Jackson, 1991; Fisher & Fisher, 1992) toward the overall goal of reducing the annual number of newly infected young adults.

McEwen (1993) utilized the Health Motivation Model to examine the motivation of health promotional behaviors. Specifically, this study focused on determining the variables that would produce and influence the motivation of health promotional behaviors and how these variables interact. Thus, the need to conduct research combining the theory of motivation and HIV prevention is timely and of an urgent nature in order to prevent more young adults from acquiring HIV infection.

HIV/AIDS will have a great impact on the next generation of adults. "Given the latency from time of infection to disease, the vast majority of infected teenagers will not become sick until the very time when they would be joining the labor force, forming families, and entering the most eco-

nomically productive years of their lives" (Hein, 1992, p. 14). Therefore, it is imperative that adolescents and young adults learn HIV prevention skills and that health educators research the best means to reduce the number of individuals becoming HIV infected.

This study specifically surveyed college students from both urban and rural communities about their motivation toward HIV prevention and their current HIV risk behaviors. The intention of this research study is to provide data on college students regarding motivation and HIV risk behaviors and also to examine differences that may exist between students from these two communities.

Background Literature

Since the onset of the AIDS epidemic, adolescents and young adults have been at risk of contracting the human immunodeficiency virus (HIV) because many engage in risky sexual behavior as well as injecting drugs. The high rate of risk-taking behavior suggests that this age group will experience HIV infection at an increased rate (DiClemente, 1990). In the June 1996 CDC Surveilliance Report, 18%, or 98,028 cases of AIDS, were within the 20-29 year old age category. In addition, 45% of the AIDS cases fell within the 30-39 year old age group. This supports the 1989 conclusions by the CDC that HIV would continue to increase across the 13-30 year old population (CDC, 1989).

The number of adolescents and young adults age 13-19 years diagnosed with HIV and AIDS in the United States continues to increase. Within a few years, AIDS has become one of the leading causes of death in the United States. According to Hein (1992), AIDS was the ninth leading cause of death among children age one to four, and the sixth leading cause of death among those age fifteen to twenty-four. In the latter age group, the number of AIDS related deaths increased one-hundred fold between the years 1981 and 1987. AIDS as a cause of death, is moving rapidly toward the top five leading causes of death in young people age fifteen to twenty-four (Hein, 1992).

Rural America is not immune to HIV infection as the number of new AIDS cases is multiplying at a rapid rate and the AIDS epidemic has become increasingly dangerous as it spreads into these areas (Lam & Liu, 1994). There was a thirty-seven percent increase in 1989 of diagnosed AIDS cases in rural areas as compared to a five percent increase in areas with a population of over 500,000 (National Commission on AIDS, 1990). In 1990, the CDC stated that twenty percent of the AIDS cases in the United States were diagnosed in rural areas and the AIDS epidemic is shifting from urban areas to rural areas of the South and Midwest (Kaiser Family Foundation, 1996). The CDC (1995a) reported that 5.36% of AIDS cases were found among residents of areas with less than 500,000 in population, indicating that AIDS outside of urban America is rising. Based on the increase of AIDS cases in rural areas, Holmberg (1996) stated that there is a need for epidemiological research and public health interventions to determine why HIV infection continues to be a problem in small cities and rural areas. Therefore, young adults reared in rural communities may have additional concerns and issues surrounding HIV prevention versus those reared in urban communities.

HIV education is desperately needed in rural communities. Ignorance and misinformation impede adequate care for those who require medical treatment as well as those who need to participate in HIV prevention education. Educational programs must be developed based on the unique characteristics of rural communities with dissemination into the community. The programs must be realistic, up-to-date, and directly address all the issues surrounding HIV infection. As the number of AIDS cases continues to rise in the United States, rural America will experience a growing need for education and knowledge, essential components in the fight against HIV, as well as expanded assistance programs for those already affected.

A number of studies in the past have focused on young adults' knowledge, attitude and behavior about HIV/AIDS with the results from these studies applied to educational programming. Researchers found that young adults have a good understanding of the basic facts regarding HIV/AIDS; however, many still engage in high risk behaviors. The Centers for Disease Control and Prevention conducted a study to examine the extent to which American college students are at risk for HIV infection (Douglas, et al., 1995). Labeled The 1995 National College Health Risk Behavior Survey, the study gathered data from a representative sample of full and part- time undergraduate students age 18-24 years, attending both two and four year private and public schools. The results indicated that the high number of sexual partners and lack of consistent condom use put both female and male college students at risk for HIV infection.

Peer pressure, lack of maturity, and alcohol and drug use seem to be the major factors that place college students at risk for HIV infection (CDC,1995b). College students are less likely to take precautions against acquiring HIV when under the influence of mind-altering drugs. Their perceptions of vulnerability significantly decrease and their judgments about perceived risks of a specific situation are altered when influenced by drugs and alcohol. Therefore, if individuals do not perceive themselves as susceptible to particular health threats, they are not likely to adopt self-protective behaviors (Burger & Burns, 1988).

College students continue to practice HIV risk behaviors because they do not feel they are susceptible to acquiring HIV. For example, heterosexuals who do not inject drugs minimize their threat toward HIV infection and tend to underestimate the number of AIDS cases within the population (Mickler, 1993), thus believing that "it-can't-happen-to-me." Mickler's article on college students' perceptions of their own and other people's vulnerability to AIDS discussed a phenomenon called the illusion of unique vulner-

ability (Burger & Burns, 1988). This phenomenon is a self-serving bias that affects individuals' judgment of their personal probability of experiencing a negative incident. Mickler's research on heterosexual college students' vulnerability to AIDS found that the respondents believed they were at low risk for acquiring HIV. The college students also felt they were less susceptible for HIV than other people, even those of the same gender, sexual orientation, and vocation. The majority of participants felt that his or her own chance of contracting HIV was less than 8 in 100. Based on these findings, it was recommended that health educators need to inform and convince young adults that there is a possibility they could contract HIV if they participate in high risk behaviors.

Since the spread of HIV infection is primarily due to the practice of risk behaviors, many researchers examined behavioral theories as a mode to help explain why individuals practice high risk behaviors. Many researchers have stressed the importance of incorporating behavioral theory research with introductory HIV/AIDS education research in order to help explain and predict health-related behaviors. Theories can give educators a framework for the goals of an intervention, or assist in explaining the determinants of risk-taking behaviors when working with defined populations. Utilizing theories to develop HIV prevention programs may help to improve educational efforts, saving valuable time, resources, and lives.

The majority of research on motivation has been traditionally conducted in the areas of behavioral psychology (McClelland, 1985; Weinberger & McClelland, 1990), business administration (Maher & Braskamp, 1986), and most recently in the area of health education (Fisher & Fisher, 1992). According to Weinberger and McClelland, the word "motivation" is derived from the Latin word *movere*, which means "to move." Among many psychological research projects, the question of what motivates individuals to behave in a certain manner has been of keen interest. Psychologists want to reveal the causes of behavior, and motivation is one aspect of human behavior that may assist in answering why people behave in a certain way. Specifically, when studying the concept of motivation, psychologists are attempting to explain the psychological causes of action or behavior (Weinberger & McClelland, 1990). Myers (1989) defined motivation as "a need or desire that serves to *energize* behavior and to *direct* it toward that goal" (p. 349). In fact, in 1981, Kleinginna and Kleinginna (cited in Weinberger & McClelland, 1990), reported ninety-eight separate definitions of motivation, thus showing its diverse phenomena and theoretical orientations.

The movement toward the concepts of health and motivation as an entity in and of itself did not appear in the literature until after the introduction of the Health Belief Model (Rosenstock, 1974). The terms health motivation and wellness motivation have been utilized by health education professionals and nursing professionals in order to help explain and understand the "whys" of behavior. Wellness motivation has been defined by Cox and Wachs (1987) as an individual's intention to initiate and sustain health behavior. Health motivation is defined as constantly changing, multifaceted, interacting forces (either perceived or actual) which affect choices and result in behavior or action(s) that influences the individual's health (McEwen, 1993). Either definition can be used to understand and help define the "whys" of an individual's behavior toward health promotion or destruction. Over the past decade, there have been numerous studies conducted on the relationship between motivation, behavior, and health. Many research studies have been conducted in the fields of physical fitness, cardiovascular health, and other health education areas (Burke, 1987; Clarke, 1991; Fleury, 1991).

Theoretical frameworks are important to the development of HIV prevention programs. Programs are often more distinct and easily evaluated when a specific theoretical base underlies the program (Huszti & Chitwood, 1989). One such model that has been utilized in many areas of health education is the Health Belief Model, which guided the direction and development of the Health Motivation Model. The Health Belief Model was designed to explain health behavior and to help educators understand health motivation and health beliefs while focusing on health preventive actions (McEwen, 1990). Based on this concept, the Health Motivation Model was developed to focus on the motivation of health promotional behaviors. The variables included in the Health Motivation Model are previous knowledge, external aids and hindrances, internal aids and hindrances, perceived value of action, and a catalyst.

HIV/AIDS will have a great impact on the next generation of adults. Since this disease does not show its ill effects until years after the antibodies are detected, many adolescents and young adults will not become ill from HIV until later in life (Hein, 1992). Therefore, it is imperative that adolescents and young adults learn more than just the facts about HIV. They need to learn prevention skills that are based on their behaviors and understand why they chose to participate in high risk behaviors. Utilization of the Health Motivation Model can provide health educators with additional information when developing HIV/AIDS prevention programs. Examining the motivation of young adults toward preventing HIV can give health educators a better understanding of why many individuals in this population continue to practice high risk behaviors. Incorporating the reasons why young adults are not motivated toward HIV prevention can, hopefully, lower the number of infected individuals each year and, ultimately, remove AIDS as a leading killer of this age group.

Methodology

The Health Motivation Assessment Inventory (McEwen, 1990), a self-report instrument, was modified and used to

obtain data for this study. The survey instrument, a modified version of the Health Motivation Assessment Inventory, assessed how an individual was motivated to engage in a behavior which was perceived as beneficial to health, and consisted of 4 demographic questions, 35 health motivation questions, 3 HIV behavioral risk questions, and one open-ended question, the catalyst variable. Subjects were given the instrument to complete during one of their undergraduate health courses.

Results and Discussion

The final study was conducted at three universities in Indiana. The sample of 595 subjects was obtained from 630 questionnaires. Subjects in this study included undergraduate young adults between 18 and 21 years of age.

Treatment of the Data

To test the hypotheses related to the study, (a) 2X2 analysis of variance (ANOVA) procedures were performed on each behavioral variable to test main effects for knowledge (KNOW) and community (COMMUN) as well as for possible knowledge by community interactions, and (b) 2X2 ANOVA procedures were performed on each behavioral variable to test main effects for motivation (MOT) and community (COMMUN) as well as for possible motivation by community interactions. Additionally, qualitative analysis was performed on the open-ended catalyst question. Qualitative data analysis was used as an inductive process of organizing the data into categories and identifying patterns among the categories (Schumacher & McMillan, 1993).

The hypothesis was tested using the null form with an α=.05 as the level of significance for all quantitative statistical procedures.

Sample Characteristics

Table 1 summarizes the frequency and percent of the entire sample for each of the following demographic variables: age, class rank, community (where the subject grew-up), race/ethnicity, gender, number of sexual partners, condom use during last sexual intercourse, and injecting drug use (IDU). Since an aspect of this study was to examine health motivation and HIV risk behaviors among college students from rural communities, data regarding college students from rural communities are also presented in comparison to college students from urban communities.

Demographic Characteristics

The age distribution of the 595 subjects included in this study were primarily 21 years old or older (32%), and the majority were sophomores (29%). The distribution that identified the community where the respondents grew-up consisted of urban (53%) and rural (46%). The racial and/or ethnic distribution was primarily European American (White, 85%). The gender distribution indicated the majority were female (65.9%) and 34.1% were male.

Behavioral Characteristics

Table 1 also presents the behavioral characteristics of the entire sample. With regard to number of lifetime sexual partners, 35% indicated having had sexual intercourse with 1 or 2 partners. With regard to condom use during the last sexual intercourse experience, 141 (23.7%) indicated never having had sexual intercourse. Of those who were sexually active, 230 (38.7%) of the subjects or their partner used a condom during their last sexual intercourse experience, and 224 (37.6%) of the subjects or their partner did not use a condom during their last sexual intercourse experience. The number of subjects who never injected illegal drugs was 98%.

Testing of the Hypothesis

This study involved a convenience sample, examining a set of independent variables, motivation toward HIV prevention (MOT) and community (COMMUN) with the following dependent behavioral variables: number of sexual partners in lifetime; condom use during last sexual intercourse experience; and use of injecting drugs during lifetime. In order to test the hypothesis related to this study, 2X2 Analysis of Variance (ANOVA) methods were applied to each of the dependent variables.

Hypothesis

There is no difference between motivation related to HIV prevention and HIV risk behavior among college students from urban and rural communities.

The percent, mean and frequency of urban and rural subjects' level of motivation toward HIV prevention, and the number of sexual partners during their lifetime was calculated (Table 2). For both urban and rural subjects, the higher the level of motivation toward HIV prevention, the lower the number of sexual partners reported.

To test the null hypothesis, three 2X2 analysis of variance (ANOVA) procedures comparing motivation and community (urban and rural) with each of the HIV risk behavior dependent variables (sexual activity, condom use, and injecting drug use) were conducted. The results of the first ANOVA with the number of sexual partners revealed a significant main effect for motivation (F=34.06, p=.001). A non-significant F-ratio was calculated for community, as well as for the MOT X COMMUN interaction (Table 3).

The percent, mean, and frequency of urban and rural subjects' level of motivation toward HIV prevention and condom use during their last sexual intercourse were calculated. Both the urban and rural groups indicated that with a higher level of motivation toward HIV prevention, condoms were more likely to be used by the subject or their partner (Table 4).

Table 1.

Summary of Sample Characteristics

Variable	*f*	Percent	Urban, *f* (%)	Rural, *f* (%)
Age:				
17 yrs	8	1	4 (1)	4 (1)
18 yrs	116	19	65 (21)	51 (18)
19 yrs	159	27	76 (24)	83 (30)
20 yrs	116	20	64 (20)	52 (19)
21 yrs and older	196	33	108 (34)	88 (32)
Class Rank:				
Freshman	149	25	79 (25)	70 (25)
Sophomore	177	30	91 (29)	86 (31)
Junior	133	22	67 (21)	66 (24)
Senior	136	23	80 (25)	56 (20)
Community:				
Urban	317	53	317	
Rural	278	47		278
Race/Ethnicity:				
African American	37	6	28 (9)	9 (3)
American Indian	4	1	3 (1)	1 (1)
Asian American	17	3	12 (4)	5 (2)
European American	511	86	257 (81)	254 (91)
Hispanic American	26	4	17 (5)	9 (3)
Gender:				
Female	392	66	191 (60)	201 (72)
Male	203	34	126 (40)	77 (28)
No. of Sexual Partners:				
Never had sexual intercourse	141	24	81 (25)	60 (22)
Sexual intercourse with 1 or 2 ptnrs	212	36	110 (35)	102 (37)
Sexual intercourse with 3 or 4 ptnrs	108	18	47 (15)	61 (22)
Sexual intercourse with 5 or 6 ptnrs	41	7	25 (8)	16 (5)
Sexual intercourse with 6+ ptnrs	93	15	54 (17)	39 (14)
Condom Use & Last Sexual Intercourse:				
Never had sexual intercourse	141	24	81 (26)	60 (22)
My partner/I used a condom	230	38	125 (39)	105 (38)
My partner/I did not use a condom	224	38	111 (35)	113 (40)
Injecting Drug Use:				
Never injected illegal drugs	587	99	315 (99)	272 (98)
Have injected illegal drugs	8	1	2 (1)	6 (2)

Table 2.

Percent, Mean, and Frequency of Urban and Rural Subjects' HIV Motivation Prevention Level and Number of Sexual Partners During Lifetime

	URBAN			RURAL		
MOTIVATION	%	*Mean	*f*	%	*Mean	*f*
high	87.1	1.0	276	90.6	1.0	252
low	12.9	2.4	41	9.4	2.5	26

(*0=no sexual partners; 1= 1-2 sexual partners; 2=3-4 sexual partners; 3=5-6 sexual partners; 4=6 or more sexual partners)

Table 3.

Subjects' Number of Sexual Partners During Lifetime: Summary of 2X2 Analysis of Variance (ANOVA)

Sources of Variance	SS	df	MS	*F*	*p*-value
Main Effects	60.43	2	30.21	17.71	.001
MOT	59.04	1	59.04	34.60	.001
COMMUN	.12	1	.12	.07	ns
2- Way Interactions	.009	1	.009	.05	ns
MOT COMMUN	.009	1	.009	.05	ns
Explained	60.80	3	20.28	11.88	.001
Residual	1008.34	591	1.71		
Total	1069.19	594	1.80		

Table 4.

Percent, Mean, and Frequency of Urban and Rural Subjects' HIV Motivation Prevention Level and Condom Used During Last Sexual Intercourse

	URBAN			RURAL		
MOTIVATION	%	*Mean	*f*	%	*Mean	*f*
high	87.1	1.0	276	90.6	1.0	252
low	12.9	2.0	41	9.4	2.0	26

(*0=no sexual partners; 1=partner/subject used a condom during last sexual intercourse; 2=partner/subject did not use a condom during last sexual intercourse)

In order to continue to test null hypothesis, a 2X2 analysis of variance (ANOVA) comparing motivation and community with the second dependent variable, condom use during last sexual intercourse, revealed a significant main effect for motivation (F= 38.45, p=.001). A non-significant F-ratio was calculated for community, as well as for the MOT X COMMUN interaction (Table 5).

The percent, mean, and frequency of urban and rural subjects' level of motivation toward HIV prevention and injecting drug use during their lifetime were calculated (Table 6). Injecting drug use was low for both urban and rural subjects, which was also consistent with a high level of motivation toward HIV prevention.

In order to complete the testing of the hypothesis, a 2X2 analysis of variance (ANOVA) comparing motivation and community with the third dependent variable, injecting drug use during lifetime, revealed a significant main effect for community (F= 4.54, p=.007), and for motivation (F= 4.96, p= .007). Additionally, a non-significant F-ratio was calculated for the MOT X COMMUN interaction (Table 7).

Since each of the results of the ANOVA calculations for all three dependent variables did not meet the criteria for significance, the null hypothesis was retained.

Table 5.

Subjects' Condom Use During Last Sexual Intercourse: Summary of 2X2 Analysis of Variance (ANOVA)

Sources of Variance	SS	df	MS	*F*	*p*-value
Main Effects	21.90	2	10.95	19.58	.001
MOT	21.50	1	21.50	38.45	.001
COMMUN	2.31	1	2.31	4.14	ns
2- Way Interactions	.66	1	.66	1.18	ns
MOT COMMUN	.66	1	.66	1.18	ns
Explained	22.89	3	7.63	13.64	.001
Residual	330.53	591	.56		
Total	353.42	594	.60		

Table 6.

Percent, Mean, and Frequency of Urban and Rural Subjects' HIV Motivation Prevention Level and Injecting Drug Use During Lifetime

	URBAN			RURAL		
MOTIVATION	%	*Mean	*f*	%	*Mean	*f*
high	87.1	0.0	276	90.6	0.0	252
low	12.9	0.0	41	9.4	0.8	26

(*0= have not used injecting drugs during lifetime; 1=have used injecting drugs during lifetime)

Table 7.

Subjects' Injecting Drug Use During Lifetime: Summary of 2X2 Analysis of Variance (ANOVA)

Sources of Variance	SS	df	MS	*F*	*p*-value
Main Effects	130	2	.006	4.96	.007
MOT	.009	1	.009	7.24	.007
COMMUN	.005	1	.005	4.54	.034
2- Way Interactions	.002	1	.002	1.76	ns
MOT COMMUN	.002	1	.002	1.76	ns
Explained	.14	3	.004	3.50	.015
Residual	7.76	591	.001		
Total	7.89	594	.001		

Qualitative Analysis

One open-ended question, in Part IV, was placed on the survey instrument in order to assess the variable catalyst. This section of the instrument was designed to capture a critical event in which the subject was motivated to participate in an action or behavior that can be perceived as beneficial toward HIV prevention. The responses from this section were examined independently from the previous three sections of the instrument. Part IV of the instrument was identified as "Incentive." The subjects were given the following directions:

Briefly answer the following question in the space provided below: Name an event or situation that you believe would motivate you to avoid HIV infection. For example: You learn that a friend is infected with HIV. Due to this news, if you would decide to become sexually active, it would be with only one uninfected partner.

Urban

The response rate for this question from urban subjects was 62% (n=196). As each response was examined, two specific categories were developed based on how the subject recorded his or her answer. The first category (Category I) was that an event needed to occur in order for the respondent to consider taking action or change their behaviors. The second category (Category II), which included more responses, indicated that prevention behaviors currently exist. Specifically, the prevention behaviors are practiced because either an event has already occurred or subjects' level of knowledge about HIV has caused them to protect themselves against HIV infection.

Rural

The response rate to the catalyst question from rural subjects was 50% (n=137). As each response from the rural subjects was recorded, categories, themes, and patterns were explored. The two categories that emerged were the same as the urban categories. The first category (Category I) was that an event needed to occur in order for the respondent to consider taking action or change current behaviors toward HIV prevention. The second category (Category II), was that prevention behaviors currently exist due to an event that has already occurred. The second category, overall, had more responses than the first category.

Discussion

When examining the sexual behaviors of the students in this sample, the majority have had sexual intercourse in their lifetime. The results regarding sexual experience was about the same for respondents from urban (74%) and rural (78%) communities. Overall, the entire sample is at a higher risk for HIV infection by being sexually experienced, especially those indicating having 2 or more sexual partners in their lifetime. These results are consistent with other research which indicates that 80% of female and 77% of male college students have had sexual intercourse in their lifetime (Douglas, et al, 1995). The current study does not differentiate between married and unmarried subjects. Therefore, further investigation is warranted since this issue has an effect on measuring HIV-risk. Further research might include measures on personal demographics regarding current sexual practices instead of lifetime sexual practices.

The second behavioral question, which was a good indicator of HIV risk behavior among the subjects, dealt with condom use. Condom use by the subject or partner during their last sexual intercourse experience was indicated at a slightly higher incidence than those subjects and partners who did not use condoms. In comparison to urban subjects, rural subjects and their partners were less likely to use a condom during the last sexual intercourse experience. The 1995 National College Health Risk Behavioral Survey (Douglas et al., 1995) results corroborate this by stating that over a third of the subjects reported using a condom at last intercourse. However, it is unsure if the subjects in this research study, who indicated they were sexually active, were also using condoms during every episode of sexual intercourse.

Finally, an overwhelming number of students in this study have not injected illegal drugs in their lifetime. The majority of those who did indicate using illegal injecting drugs were from rural communities. Although anonymity was stressed, many students may not have answered this question honestly due to the fact that injecting certain controlled drugs is illegal and they may have feared prosecution. Additionally, the question regarding illegal injecting drug use did not specify if the respondent *shared* the injecting drug needle. Further investigation should include "sharing" of injecting drugs to further capture true HIV risk behavior.

The hypothesis addressed the differences between community and motivation with HIV risk behaviors. Motivation toward HIV prevention was significant, specifically with regard to the number of sexual partners, condom use during last sexual experience, and injecting drug use. The community in which the subject grew-up did not have a significant influence on the HIV preventive behaviors examined in this study. Implementation of the concept of motivation for HIV/AIDS educational programs should be incorporated by sexuality educators. The discussion of motivation can be included in an HIV/AIDS program, especially integration with the topics of self-esteem, preventive HIV behaviors, peer pressure, and the etiology of HIV infection.

This study does not differ in behavioral results with other studies comparing rural and urban young people. Too many health professionals mistakenly believe that youth living in rural areas are shielded from the many risk factors that increase their exposure to HIV infection (Durrant, 1992). This

research study suggests that many young people living in rural areas are engaging in HIV risk behaviors which are very comparable to those living in urban communities.

The catalyst question which inquired about an event which may promote the prevention of HIV infection yielded a significant number of responses from the subjects. Two basic categories emerged from the responses. The first was that an event had already occurred; therefore, the respondents in this category indicated that they were currently practicing HIV preventive behaviors. Many of the subjects shared a major incident surrounding an issue of AIDS which caused them to seriously re-evaluate their HIV risk behaviors. The issues, whether it was the death of someone with HIV or having been exposed to HIV from a previous sexual partner, made enough impact on the subjects' lives to motivate them to practice HIV preventive behaviors. In addition to reinforcing basic HIV/AIDS facts, this information encourages health educators to inform young adults about the human reality of HIV/AIDS.

The second category of responses indicated that an event would need to happen in order for the subjects to incorporate HIV preventive practices. The subjects in this category stated that they would have to be personally affected by HIV/AIDS before they would consider practicing HIV preventive behaviors. Again, health educators can utilize these responses to assist young adults in making conscious personal decisions about their behavior. Specifically, health educators can convey the important message that young adults should not wait for something bad to happen before taking preventive measures against acquiring HIV infection.

Practical Implications for Health Educators

HIV/AIDS will continue to present a tremendous challenge to every community. However, with each challenge is an opportunity to examine beliefs, attitudes, and behaviors. Health educators can help communities face the challenges of HIV/AIDS by sharing information through open discussions about sexuality, as well as sexual and injecting drug practices.

This study showed that motivation had an effect on the degree to which the subjects in this study practiced HIV prevention behaviors. What motivates a person to behave in a certain way depends on many factors. Health educators can devise teaching methods that emphasize motivation is necessary to promote the importance of practicing HIV preventive behaviors. For example, the health educator can survey the students about their future goals and then educate the students about the fact that people with HIV infection have a shortened life span, and, therefore, are not able to achieve future goals. Educational programming can relay the message that a certain degree of motivation toward the prevention of HIV infection is necessary if the students are to achieve their future goals.

With information obtained from this study, health educators can conduct educational programming which may lead to a greater understanding of HIV/AIDS among young adults. Educating people about HIV/AIDS is never an easy task; however, prevention messages, coupled with motivational theory, can be essential to creating a better understanding of HIV/AIDS and halting its spread.

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Strategies For Strengthening Professional Preparation In Support of HIV Prevention and Health Education

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Introduction

Parents, teachers and community members in many rural areas in the Unites States perceive a low need for aggressive implementation of HIV prevention through health education programs designed to focus on HIV prevention and other high risk health behaviors. Their perception is supported by their belief that risk taking behaviors that put youth in serious jeopardy are mainly a problem of urban environments (Cohen, 1997). This often leads to underdeveloped and insufficiently supported educational programs in schools to address HIV prevention and other health risk areas. However, HIV prevention programs and health education are required in the majority of states. In addition, the statistics indicate that the incidence of HIV infection and AIDS in rural areas has been increasing. From 1991 to 1992 the incidence of AIDS increased three times faster in the rural areas than the urban and suburban areas of residence (Berry, 1993 & Cohn, 1997).

According to Berry (1993), the epidemiology of AIDS in rural areas has not been fully defined. What is known is that during the first wave of the epidemic AIDS primarily affected gay or bisexual men in the rural areas. During the second wave of the epidemic, those most at risk for HIV infection are in the rural South, women (particularly African American women), adolescents, migrant and seasonal farm workers, and people who abuse substances, including alcohol. Poverty is also associated with the second wave of the epidemic (Berry, 1993). Topping and Hartwig (1997) described their patients in rural areas who are HIV infected as more likely to have become infected through heterosexual contact or through injected drug use, more likely to be poor, and more likely to be African American.

It is the concern for HIV infection in the youth population that has been the primary target for the HIV prevention program of the American Association for Health Education (AAHE). In a study which assessed knowledge and attitudes about AIDS among adolescents in the rural southwest part of the country, it was revealed that students had knowledge of the basic transmission routes. However, misconceptions on casual contacts and negative attitudes persist in ways that could interfere with youth adopting safe behavior (Miller, W.A., Qualtere-Burcher, P., Lauber, C., Rockow, J.P, & Bauman, K.A., 1990). This study further indicated a need to strengthen the educational outreach of prevention programs in rural areas.

In rural areas there are fewer resources and little competition for health education and health services. Thus, sparsely populated rural areas rely more upon the local school as the outlet for program dissemination (Institute of Medicine, 1997). Thus, it is essential that schools deliver strong HIV prevention programs. There is consistent support by many organizations for the philosophy that HIV prevention should be delivered through comprehensive health education (K-12). This would maximize reinforcement of essential health education skills such as data gathering, analysis, decision-making, and refusal skills. One of the primary challenges presented by relying upon the school for prevention programs is the lack of teacher preparedness to deal effectively with HIV prevention and comprehensive health education. The overwhelming majority of classroom teachers for grades K-5 have little or no pre-service training in health education, even though there is agreement at local, state and national levels that they are the best person in the school environment to effectively deliver health education. It is recommended by most states and professional organizations that students in the middle school grades be taught by a health education specialist. However, states approach this issue in various ways. Some states make no provision for health education specialists in middle grades and some states allow health education as a specialty area in their middle school teacher certification. Other states have health education combined with physical education for middle school grades and above. There is little consistency in actually having a trained health education teacher for the middle grades in most school systems.

To bridge the gap between the level of elementary and middle school teacher preparedness and the expectation that they present HIV prevention programs in the classroom, local education agencies(LEAs) and state education agencies(SEAs) have spent significant resources during the past decade to provide in-service professional development to teachers. The next area of major need, apparent to AAHE, is to stem the tide of elementary and middle school teachers graduating from teacher education programs without the preparation necessary to deliver comprehensive health education which includes HIV prevention. The leadership of the Association believe that teacher preparation programs for elementary teachers, middle school generalists, and special education teachers really must prepare their teachers in HIV prevention and health education unless the educational system wants to continue to force LEAs and SEAs to bear all of

the responsibility for preparing classroom teachers for grades K-6 in some states, and grades K-8 in other states, to deliver HIV prevention and health education. For the past four and a half years, AAHE has implemented a series of strategies for strengthening professional preparation in support of HIV prevention as a part of comprehensive health education in schools.

An unpublished study (Breitenstein & Fortune, 1996), determined the top ten barriers to preparing elementary, middle school, and special education teachers in the areas of comprehensive school health education and HIV prevention. The following are among the barriers:

- Comprehensive School Health Education is not a national priority
- There is a general lack of understanding among educators of the importance of school health and its value to children and youth.
- Health education is not perceived as part of the "core" K-12 curriculum
- Discomfort with HIV/AIDS education, including education about condoms
- Lack of awareness that Health Education is a separate curriculum entity

In support of the belief that it is essential for the nation to close the gap between what elementary, middle school, and special education teachers are expected to teach and what they are prepared to teach, AAHE developed a five year project funded by the Division of Adolescent and School Health of the Centers for Disease Control and Prevention which focuses on strengthening the professional preparation of teachers for the delivery of HIV prevention and comprehensive school health education programs. The activities of the past four and a half years are described below.

Four Component Approach

There are four major components of the AAHE approach to enhancing the health education preparation of elementary, middle school generalists, and special education teachers. These are:

1. Development of School Health Education Advocates (SHEAs).
2. Development and agreement on the competencies that teachers need.
3. Materials to assist teacher education faculty in preparing future teachers.
4. Developing support for enhanced teacher preparation by state and local agencies.

School Health Education Advocates

There are approximately 1,200 institutions of higher education that prepare teachers. The majority of these campuses have elementary teacher preparation as part of their offerings. In contrast, there are health education professional preparation programs (majors and minor programs) on approximately 215 campuses. That means that nearly a thousand campuses may be actively preparing elementary and middle school teachers in an environment where there is little or no professional health education expertise. Who will be the advocate for implementing preparation in health education for elementary, middle school, and special education teachers on these campuses? It could be any interested and caring teacher education faculty member, but unless someone is specifically identified, no one will be advocating for this purpose on campus.

It was with the situation above in mind that AAHE staff has recruited teacher education faculty on over 680 campuses across the country to serve as School Health Education Advocates(SHEAs). What are the expectations of SHEAs? They have made a commitment to:

- Promote the inclusion of health education, including HIV/AIDS prevention education, in the course work of elementary, middle school, and special education teachers.
- Strengthen collaboration between elementary and middle school preparation faculty and health education preparation faculty where health education programs exist.
- Receive the HIV/AIDS project newsletter and other pertinent correspondence and circulate these resources within their department/college/school of education.
- Assist in the assessment of the status of teacher education programs with regard to health education, including HIV/AIDS prevention education.

Each SHEA has developed an individualized action plan and reports the progress being made on campus in relationship to the expectations listed above. This reporting process assists the AAHE staff to determine the impact of the SHEA network.

Teacher Competencies

In 1989, AAHE convened a joint committee with the American School Health Association to develop educational standards for the preparation of elementary teachers in the area of health education. The outcome of that work was a series of responsibilities and competencies to serve as guidelines for use by teacher preparation faculty. AAHE currently distributes a brochure entitled *Health Instruction Responsibilities and Competencies for Elementary Classroom Teachers*. The anticipated outcome is that as a result of their professional preparation program, prospective elementary teachers will be capable of assuming these responsibilities and demonstrating these competencies in the classroom. The responsibilities and competencies were modeled after *A Framework for the Development of Competency-based Curricula for Entry Level Health Educators* (National Task Force on the Preparation and Practice of Health Educators, 1985)

A second document, in development, outlines the responsibilities and competencies of non-health education specialists at the middle grades level of instruction. It focuses upon

the role of health education in the middle grades curriculum and how middle school teachers have an opportunity to collaborate with the implementation of the comprehensive health education curriculum and the coordinated school health program. This work is being developed in collaboration with the National Middle School Association and a variety of other national education organizations.

Materials for Teacher Education Faculty

The project staff has developed a variety of materials during the past four years which include:

- What Every Educator Should Know About HIV/AIDS Education
- A policy resolution in support of teacher preparation in health education
- A project Newsletter which is published periodically and mailed to all SHEAs (currently on volume 4)

The newsletter provides: 1) news from current literature; 2) a "Deans" column written by an administrator of a college or school of education on how to strengthen HIV prevention and health education preparation for elementary and middle school teachers; 3) news on the work of AAHE and other national organizations in the area of HIV prevention education; and 4) a mechanism to report success stories from SHEAs to their colleagues on other campuses.

In addition to the SHEA newsletter, the project has mailed a variety of other materials to members of the SHEA network that were produced by other organizations which would be useful to the SHEAs in accomplishing their goals. It has been a challenge to the AAHE staff to optimize the SHEA network as a dissemination mechanism and still maintain quality control over the materials that the SHEAs receive. The goal is for them to receive a regular supply of state of the art material that will assist them in their roles without assaulting them with a myriad of commercial materials.

Support for Teacher Preparation by State and Local Agencies

One of the important components of the project has been the development of a technical assistance kit for state and local coalitions willing to support the enhancement of teacher preparation in health education at nearby campuses. The technical assistance kit provides policy and foundation documents that can be used by groups and organizations for curriculum revision and teacher certification reform to address the need for elementary, middle school, and special education teachers to have preparation in health education and HIV prevention.

In collaboration with the Society of State Directors of Health, Physical Education and Recreation, AAHE is creating a policy development manual which provides information State Education Agencies can use to develop policies on elementary and middle school teacher preparation in health education. The long term goal is for all states to develop and implement such policies. It is anticipated that in order to reach this goal, AAHE staff may need to provide technical assistance and training for the staff of State Education Agencies on the use of the policy manual.

Conclusion

To address the HIV prevention needs of youth in rural settings it is essential that the teaching workforce be adequately prepared as schools will likely remain the primary source of prevention education. In order to ensure their preparedness, it is essential to provide the elementary, middle school, and special education teacher workforce with basic knowledge and skills they can draw upon to implement both HIV prevention education and comprehensive health education. Special knowledge and skills that will assist in implementing effective HIV prevention and comprehensive health education programs in the rural setting include: 1) awareness of the denial that HIV transmission is a significant problem for rural areas; 2) sensitivity to cultural issues specific to rural populations; 3) recognition of the emerging predominance of heterosexual transmission; and 4) mechanisms for increasing sensitivity for those infected with HIV and creating supportive environments in small communities.

The most cost effective and easiest venue in which to provide teachers with this knowledge and these skills is during the pre-service education experience. What strategies can ultimately ensure that preparation? A variety of both voluntary and non-voluntary (mandated) strategies can be used to accomplish this goal. They include such possibilities as:

- state certification systems requiring health education experiences as part of teacher certification requirements
- providing health education methods courses for all future teachers in elementary education
- infusing health education competencies and skills into existing course work for elementary, middle school and special education teachers.
- obtaining NCATE guidelines that would require schools and colleges of education to prepare elementary teachers in health education in order to receive full NCATE accreditation.

All or any of these strategies could assist in meeting the goal of the teacher workforce being prepared to successfully implement HIV prevention and other health education curricula. In truth, it is likely that in the end it will be some combination of these strategies that brings about success, if indeed, success is achieved. It is with this in mind that AAHE has initiated the multidimensional project described in this article. Creating change of this magnitude is not to be perceived as a simple or easily accomplished task. Mandated change is very unlikely, but if it should occur, it will still take education faculty a number of years to make curricular adjustments. If voluntary introduction of health education preparation into existing teacher training programs is going

to be the primary method for producing a cadre of elementary, middle school and special education teachers that are appropriately prepared to implement health education and HIV prevention programs, then it is necessary to focus energy toward a decade of systematic effort, not a few years.

The voluntary approach will require collaboration with other education professionals at a level that health educators have never before conducted. Teacher educators will need to understand the essential need of a well prepared teacher workforce to deliver health education programs that work. Because health education programs exist on no more than 20% of campuses preparing teachers, many teacher education faculty will need to either seek health education professional development experiences themselves, or involve health education consultants to assist in the task of revising elementary, middle school, and special education teacher preparation programs. AAHE project staff urge all health educators interested in helping to bridge the gap in teacher education to become involved and to work toward both voluntary and mandated changes whenever opportunities arise.

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The Relationship of Family Factors To Alcohol Use and Sexual Risk Behavior: Implications for HIV/AIDS Prevention

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Abstract

In this study of 135 university undergraduates, we used a retrospective event-specific methodology to examine the relationship of family variables at age 10-12 to alcohol use and high-risk sexual behavior at time of first intercourse and at time of first intercourse with most recent sexual partner. Family variables did not predict alcohol use but did predict condom use. Also, we found that subjects' relationship with their same-sex parent at age 10-12 was a more powerful predictor of future condom use than their relationship with their opposite-sex parent. The authors discuss the implications of these and other findings for HIV/AIDS prevention.

The behavior of many adolescents puts them at high risk for contracting the HIV virus. Public health agencies such as the Centers for Disease Control (CDC), National Institute on Drug Abuse, and the U.S. Public Health Service have all targeted adolescents as a potential risk group (Bingham, 1989; CDC, 1990; Schuster, 1988; U.S. Public Health Service, 1987). While the AIDS mortality rate for 15- to 24-year-olds is low, AIDS has become one of the 10 leading causes of death for this age group (Kilbourne, Buehler, & Rogers, 1990). Although only a small percent of AIDS cases are in the under 20 group (2%), 18% fall in the 20- to 29-year-old group (CDC, 1996). Given the long incubation period of the disease, many in this group were probably infected as teens.

Of particular concern are the high-risk sexual behaviors which put adolescents at risk for contracting the HIV virus (Donovan & McEwan, 1995). AIDS education and prevention programs must directly address these risky behaviors (Adams, Piercy, Jurich, & Lewis, 1992). We must also study why some adolescents engage in life-threatening risk-taking behavior. Unless we better understand the causes of sexual risk-taking behavior, our efforts at effective intervention will be compromised.

Adolescents' High Risk Sexual and Drinking Behaviors

Alcohol has been identified as one potential cause of sexual risk-taking (Cooper, 1992; Donovan & McEwan, 1995; Flora & Thorensen, 1988), particularly for adolescents. Adolescents who report heavy drinking are more likely to have unprotected sexual intercourse (Luster & Small, 1994; Parker, Harford & Rosenstock, 1994). Similarly, approximately 40% of the college students participating in a study by Desiderato & Crawford (1995) indicated that they would probably be less likely to use condoms during sex if they had consumed alcohol. In a national household probability sample of adolescents, Elliot and Morse (1989) report that 23% of boys who had sexual activity in the previous year used alcohol. Sexually active young women are also more likely to use alcohol than those who have not had sexual intercourse (Zabin, Hardy, & Smith, 1986). Adolescent involvement in alcohol has been related to the early onset of sexual activity, increased frequency of sexual activity, and a higher degree of sexual involvement (see reviews by Donovan & McEwan, 1995, and Ensminger, 1987). Moreover, Mott and Haurin (1988) found these relationships to be independent of race and gender. Indeed, Bentler and Newcomb's (1986) research suggests that the strength of the relationship between alcohol use and sexual behavior may have been systematically underestimated due to the unreliable measurement of one or both of these behaviors.

Particularly important to AIDS prevention is the fact that, although condom use among teens has doubled during the 1980s (Forrest & Singh, 1990), several studies suggest that alcohol use may reduce condom use (Parker et al., 1994; Robertson & Plant, 1988; Strunin & Hingson, 1992).

The Alcohol - Sexual Behavior Link

Although alcohol and sexual behavior have been linked throughout history in our literature and popular culture, as well as through correlational research such as that cited above, the causal link is less clear (Cooper, 1992). It may be that adolescent alcohol consumption does indeed increase the likelihood of high risk sexual behavior. This may happen through the disinhibiting nature of alcohol or through affecting cognitive abilities necessary to foresee the consequences of behaviors. One's expectations of the effects of alcohol may also affect sexual behavior (Cooper, 1992). Alternatively, some third factor, such as sensation seeking personality or unconventionality, may be affecting both sexual and drinking behavior. In addition, cultural patterning and social learning would appear to play a role in both alcohol and sexual behaviors. Finally, the context of both behaviors may be important factors. For example, for adolescents both drinking and sex often occur in contexts where adults are not present (e.g., after school) and where both behaviors are sanctioned by peers (e.g., parties) (Cooper, 1992; Leigh, 1990b; Leigh and Stall, 1993).

The Family as a Potential Influential Variable

The above discussion highlights the importance of identifying the conditions that may influence alcohol use and risky sexual behavior as well as their progression to HIV infection. One promising factor to examine is the at-risk adolescent's family. The family is the central environment of most young children and can remain a powerful influence for many adolescents. Several comprehensive reviews (e.g., Glynn, 1984; Harbin & Mazair, 1975; Stanton, 1979a, 1979b) and reviews of reviews (Glynn, 1981; Stanton, 1978) have chronicled the massive research and theory related to the part played by families in teenage alcohol/drug abuse.

General family factors such as the degree of parental nurturance and support, parent-child communications, quality of the parents' marriage, quality and consistency of family management, and the substance use of parents have been found to predict adolescent alcohol/drug use (e.g., Barnes, 1984; Coombs & Landsverk, 1988; Fors & Rojek, 1983; Glynn & Haenlein, 1988; Hundleby & Mercer, 1987; Patterson, 1982; Piercy, Volk, Trepper, Sprenkle, Lewis, 1991; Simcha-Fagan, Gersten, & Langner, 1986; Stanton, 1985; Stanton & Todd, 1982). Similarly, parent-child communication and healthy family functioning have been associated with contraceptive use (Casper, 1990; Fisher, 1987; Handelsman, Cabral & Weisfeld, 1987; Leland & Barth, 1993; Luster & Small, 1994; Mueller & Powers, 1990; Sher, Emans, & Grace, 1982).

What remains unknown is the extent to which family factors may influence the alcohol-sexual behavior discussed earlier. This will be the focus of the present investigation. If family factors do influence this relationship, it may be that the family can be used more planfully in HIV prevention initiatives. That is, the impact of HIV prevention programs may be heightened by directly addressing family variables.

Time-Linked, Event-Specific Methodology

Previous studies examining the link between alcohol and high-risk sexual behavior have been criticized for focusing on general drinking habits and general frequencies of sexual activity without examining drinking and sexual behavior during the same occurrences (Leigh, 1990b). Various authors suggest instead an event-specific "critical incident" design in which respondents are asked a number of questions about a specific sexual incident (Bailey, Ennett, Ringwalt, Dennis, and Iachan, 1993; Cooper, 1992; Leigh & Stall, 1993). The target incident may be the person's first sexual experience, most recent sexual encounter, or most recent sexual experience with a non-monogamous sexual partner. Information is gathered on unsafe and "safer" sexual behaviors, and whether alcohol or drugs were used during these events (Leigh & Stall, 1993). The present study used this event-specific methodology to both examine the alcohol-sex link as well as whether the perceived early family functioning of the respondents related to both at-risk sexual behavior, defined in this study as not using condoms, and alcohol use. Two sexual incidents were used: the person's first experience of sexual intercourse and his/her first sexual intercourse with his/her most recent sexual partner.

Research Questions

The general questions we sought to address in this study include:

1. Are perceived family variables related to alcohol use at time of first intercourse?

2. Are these family variables related to safer sex behaviors at time of first intercourse?

3. Are alcohol and unsafe sex related at time of first intercourse?

4. Are the relationships identified above maintained when these variables are examined in terms of another time-specific event: first intercourse with most recent partner?

Methods

Participants and Procedure

Questionnaires were distributed to 350 college students enrolled in an introductory course in marriage and family relations at a state university in the Midwest. The introductory class fulfills a university requirement and typically enrolls students from all schools within the university. Students were instructed to complete the questionnaire at home if they were willing to participate in the study. To insure anonymity, subjects placed completed questionnaires in a self-addressed envelope and mailed it back to the present researchers.

A total of 170 students returned the questionnaire for a response rate of 49%. The sample for this study consisted of the 141 students who indicated that they had participated in sexual intercourse at some time in their lives. Six of these students were eliminated from the analyses due to missing data, resulting in a final sample size of 135 students. The average age of these participants was 19. There were 103 females (76%) and 32 males (24%). The racial breakdown was as follows: 93% Caucasian; 2% Hispanic; 1% African American; 4% Asian; 1% Native American. All schools within the university but two (Education and Veterinary Medicine) were represented by the participants.

Measures

The following instruments were used to measure family variables:

a) The Parent-Adolescent Communication Scale (PAC), a 20-item scale developed by Barnes and Olson (1982), was used to assess the quality of general communication between parents and adolescents. The measure is comprised of two subscales. The first, Open Family Communication (OFC), measures the more positive aspect of parent-adolescent com-

munication, with higher scores reflecting more positive communication. The second subscale, Problems in Family Communication (PFC), focuses on such negative aspects as hesitancy to share and negative styles of interaction. Higher scores for this subscale indicate greater problems in parent-child communication.

The presence of two factors were confirmed through an unrestricted varimax rotated factor analysis based on a national sample of 925 adolescents and their parents. The two resulting factors reflect the present two subscales of the Parent-Adolescent Communication Inventory. Chronbach's alpha for this national sample was .87 for the Open Family Communication subscale and .78 for the Problems in Family Communication subscale (Barnes and Olson, 1982). In this study, Chronbach's alpha for the completion of the scale in reference to mothers was .90 for the Open Family Communication subscale and .75 for the Problems in Family Communication subscale. In reference to fathers, Chronbach's alpha was .91 for the Open Family Communication subscale and .78 for the Problems in Family Communication subscale.

b) The Supportive Sex Discussion Scale (SSD), a nine-item scale developed by Neer and Warren (1986) was used to measure the degree to which participants perceived their discussion with their parents about sexuality to be supportive. Higher scores indicate more supportive discussions with parents. Chronbach's alpha for this study was .82 for moth-ers and .76 for fathers.

c) The Family Assessment Device (FAD). We used the General Functioning scale of the FAD in the present study (Epstein, Baldwin, and Bishop, 1983). This scale is comprised of 12 items and measures the overall health/pathology of the family. The respondent is asked to indicate on a four-point scale the degree to which each item describes his/her family. Healthier scores reflect healthier family functioning. This scale has moderate to strong correlations with the other six dimensions of family functioning measured by the FAD (r ranges from .48 to .76) and has a high degree of internal consistency (Chronbach's alpha = .92). The scale also has been found to reliably discriminate between nonclinical and clinical families. Chronbach's alpha for this study was .91.

Participants were asked to complete these scales with reference to a specific point in time, between the ages of 10 and 12 years. The early adolescent age range was set because the parent-child relationship at that age has been related to subsequent alcohol and drug use (Coombs & Landsverk, 1988) and because pre-teens in this age range have been targeted for intervention in many alcohol/drug prevention programs. Moreover, since school transitions are developmentally important phases in adolescent adjustment (Blyth, Simmons, Carlton-Ford 1983; Crocket, Petersen, Graber, Schulenberg & Ebata, 1989; Simmons & Blyth, 1987), the age range of 10-12 also reflects the time of youth transition from elementary to junior high school.

Sexually active participants were asked to think about their first intercourse experience and indicate a) whether or not they used alcohol just prior to and/or during their sexual encounter, and b) whether or not they used a condom. These two questions also were asked in reference to their first intercourse with their most recent sexual partner.

Results

Using standard discriminant function analyses, we found that family variables at age 10-12 did not reliably discriminate between participants who did and did not use alcohol at first intercourse (Wilks' Lambda = .95, p = .50), between those who did and did not use alcohol at first intercourse with most recent partner (Wilks' Lambda = .97, p = .92), or between those who did and did not use a condom at first intercourse with most recent partner (Wilks' Lambda = .97, p= .88).

However, family variables did reliably discriminate between participants who did and did not use condoms at first intercourse (Wilks' Lambda = .82, p = .001). Applying the classification weights generated by the analysis to the sample demonstrated that, overall, 73% of the cases were classified correctly. While 76% of the participants using a condom were correctly classified as condom users, 24% were misidentified as nonusers. Similarly, 70% of the respondents who did not use condoms were correctly identified as nonusers, 30% were misclassified as users.

We conducted follow-up univariate analyses of variance, with condom use versus no use as the independent variable and each family measure as the dependent variable, to examine which family variables were significantly related to use of condoms. The analyses revealed that condom use was significantly related to PFC-mother (F = 7.70, p = .01), PFC-father (F = 7.64, p = .01), and OFC-father (F = 6.39, p = .01). Compared to participants who did not use a condom at first intercourse, those who did use a condom had fewer communication problems with their mother, fewer communication problems with their father, and more open communication with their father. No other family variables were found to be significant (see Table 1).

We also explored the role of gender in the relationship of family variables to alcohol and condom use. Again, using standard discriminant function analyses, we found that family variables at age 10-12 did not reliably discriminate between participants who did and did not use alcohol at first intercourse (men: Wilks' Lambda = .76, p = .40; women: Wilks' Lambda = .95, p = .68), between those who did and did not use alcohol at first intercourse with most recent partner (men: Wilks' Lambda = .90, p = .96; women: Wilks' Lambda = .94, p = .73), or between those who did and did not use a condom at first intercourse with most recent partner (men: Wilks' Lambda = .66, p = .38; women: Wilks' Lambda = .97, p = .96). However, family variables did reliably discriminate between participants who did and did not use condoms at first intercourse for both men (Wilks' Lambda = .59, p = .05) and women (Wilks' Lambda = .81, p = .005). Applying the classification weights generated by the analyses to the sample demonstrated that,

Table 1

Means And Standard Deviations Of Family Variables For Students Who Used Versus Students Who Did Not Use Condoms At First Intercourse

Variable	Used Condom Mean (s.d.)	Did Not Use Condom Mean (s.d.)
GFS	37.34 (8.12)	34.74 (7.94)
PFC-Mother	26.39 (7.24)	29.93** (6.59)
PFC-Father	28.30 (8.04)	32.07** (6.29)
OFC-Mother	37.80 (8.77)	38.22 (7.35)
OFC-Father	33.54 (9.78)	29.15** (9.11)
SSDS-Mother	26.99 (7.77)	26.46 (6.80)
SSDS-Father	25.22 (6.63)	25.11 (5.00)
	n = 89	n = 46

* $p < .05$
** $p < .01$

overall, 82% of the cases were classified correctly for men. While 87% of the men using a condom were correctly classified as condom users, 13% were misidentified as nonusers. Similarly, 76% of the men who did not use condoms were correctly identified as nonusers, 24% were misclassified as users. In contrast, 74% of the women were correctly classified, overall. Seventy-eight percent of the women using condoms were correctly identified as condom users, with 22% being misclassified as nonusers. Sixty-nine percent of the women who did not use condoms were correctly identified as nonusers while 31% were misclassified as users.

Follow-up univariate analyses of variance revealed that, for men, condom use was significantly related to PFC-father ($F = 9.59$, $p = .004$) and OFC-father ($F = 11.51$, $p = .002$) while, for women, condom use was significantly related to PFC-mother ($F = 5.31$, $p = .02$) (see Tables 2 & 3). Compared to men who did not use a condom at first intercourse, those who did use a condom had fewer communication problems and more open communication with their father. For women, condom users had fewer communication problems with their mother than did nonusers. No other family variables were found to be significant.

Finally, chi-square analyses were conducted to examine the relationship between alcohol and condom use. Findings were nonsignificant at both first intercourse (Chi-square = .006, $p = .937$) and at first intercourse with most recent partner (Chi-square = .52, $p = .47$).

Discussion

Our results did not support the relationship of family vari-

Table 2 **Means And Standard Deviations Of Family Variables For Students Who Used Versus Students Who Did Not Use Condoms—Male Subsample**

Variable	Used Condom Mean (s.d.)	Did Not Use Condom Mean (s.d.)
GFS	39.53	35.17
	(6.28)	(7.15)
PFC-Mother	26.20	29.53
	(6.30)	(5.43)
PFC-Father	25.93	33.00**
	(6.73)	(6.17)
OFC-Mother	37.73	36.47
	(7.37)	(6.18)
OFC-Father	36.27	27.71**
	(7.00)	(7.23)
SSDS-Mother	29.01	26.82
	(6.63)	(5.85)
SSDS-Father	27.80	24.88
	(5.97)	(4.27)
	n = 15	n = 17

* $p < .05$
** $p < .01$

Table 3 **Means And Standard Deviations Of Family Variables For Students Who Used Versus Students Who Did Not Use Condoms—Female Subsample**

Variable	Used Condom Mean (s.d.)	Did Not Use Condom Mean (s.d.)
GFS	36.89	34.48
	(8.41)	(8.48)
PFC-Mother	26.43	30.17**
	(7.46)	(7.27)
PFC-Father	28.78	31.52
	(8.24)	(6.41)
OFC-Mother	12.19	10.76
	(9.07)	(7.88)
OFC-Father	32.99	30.00
	(10.20)	(10.07)
SSDS-Mother	26.57	26.24
	(7.95)	(7.40)
SSDS-Father	24.70	25.24
	(4.27)	(5.45)
	n = 74	n = 29

* $p < .05$
** $p < .01$

ables to alcohol use at two event-specific occasions. Perhaps our retrospective measurement of family functioning is problematic. On the other hand, it may be that more proximal variables (i.e., setting, peer pressure) account for whether the person uses alcohol during those occasions. Similarly, more proximal family variables (e.g., one's relationship with his/her parents at the time of the incident) may be more powerful predictors than our retrospective family data at age 10-12.

Retrospective family variables (particularly the overall quality of parent-adolescent communication), however, do seem to predict condom use, particularly for men. At time of first intercourse, the prediction rate of condom use category (i.e., use, no use) was 82% for men and 74% for women. Why would family variables result in more accurate classification of condom use for men than women? Perhaps it is because men have more control over negotiating condom use than women since condoms are a male-centered method. It may be, then, that family factors that influence boys at age 10-12 translate into better safer-sex negotiation skills at first intercourse. Or perhaps issues of faithfulness and commitment, which may be more salient for women than men, translate into women trusting their first sexual partner more than men regardless of the messages they may have gotten about safer sex from their family of origin. Similarly, the man may interpret his partner's insistence of condom use more negatively (e.g., "She doesn't trust me") than a woman might (e.g., "He cares enough to protect me."), making women's efforts to negotiate condom use less effective than the efforts of men. Again, these differences may relate to differences in early gender socialization not tapped in the present instruments.

Linguists argue that men and women have different conversational styles in situations that call for persuading another person or communicating one's values or ideas (Tannen, 1990). These conversational styles of men and women are often interpreted in different ways: men, who tend to use direct styles, are often seen as making commands or "leading the discussion." On the other hand, women, who tend to begin discussions with questions and lead discussions in a more collaborative style, are often perceived by men as "unsure of themselves" (Tannen, 1990). These different styles of communication have intriguing implications for heterosexual partners' discussions of safer sex. Perhaps when a woman tries to communicate her desire to use a condom, her partner may not take her request seriously because of her communication style. However, when a man makes a request to use a condom, his communication style may be taken more seriously, leading to a greater likelihood of safer sex behavior.

Thus, although these results suggest that family variables affect males' decisions around future safer sex behavior more than females, this conclusion may be misleading. It is possible that family variables may equally affect the values systems and ideas around safer sex for both females and males. However, women may not be as successful at convincing their partners to use a condom because of the male partners' perception of the unique communication style of many women. Whatever the reason, the quality of parent-child communication at age 10-12 translates into more responsible sexual behavior for men than women. These findings seem to suggest that early HIV prevention programs should address parent-child communication.

There are also important implications in our findings that men's relationship with their fathers was more influential for their future condom use than their relationship with their mothers while, for women, mothers were more influential than fathers. It may be, therefore, particularly important to include fathers in family interventions with sons and mothers in family interventions with daughters since the quality of these same-sex relationships seems to be a salient factor in the youth's future safer sex behavior.

Why was general parent-child communication found to be related to condom use while the family's general functioning and supportive sex discussions with parents not found to be influential? Since condom use requires negotiation, skills developed through parent-child communication may be more important to successful negotiation of condom use than the general quality of family functioning. However, we were surprised that supportive sex discussions with parents were not associated with condom use. Such discussions would seem more relevant to sexual encounters with a partner than the more global assessment of parent-adolescent communication measured by PAC. Perhaps it is the content of sexual conversations between parents and adolescents rather than the supportiveness of these discussions that is relevant to safer sex behavior. Future research is needed to explore this possibility.

We also found little support for the popular contention of alcohol use being a disinhibiting agent that increases the likelihood that a couple will not use a condom. That is, we found no relationship whatsoever between alcohol use and condom use. Our finding is similar to those of Leigh (1990), Leigh & Miller (1995), and Temple & Leigh (1992). Perhaps, rather than a disinhibiting agent, alcohol use is better thought of as a part of the ritual of sexuality for our college student subjects. However, given that some studies have found a relationship between alcohol use and condom use (e.g., Hingston, Strunin, Berlin, & Heeren, 1990; Freimuth, Hammond, Edgar, McDonald, & Fink, 1992; McEwan, McCallum, Bhopal & Madhok, 1992) our speculation must be considered tentative at best.

How do our findings relate to current theoretical models that are being applied to HIV/AIDS prevention? Cognitive theories such as the Health Belief Model (Becker, 1974) and the Theory of Reasoned Action (Ajzen & Fishbein, 1980) focus on cognitive variables as the reasons for behavior change. However, neither theory attempts to explain the origins of certain beliefs (St. Lawrence, Brasfield, Jefferson, & Alleyne, 1995). Thus, neither theory addresses directly such variables as early parental communication as factors related

to later sexual behavior.

On the other hand, social learning theory (Bandura, 1986) recognizes that individuals learn in a social context, and therefore may be more useful in helping us understand the results of this study. For example, subjects with good communication with their parents at age 10-12 may have developed self-efficacy (Bandura, 1989) that resulted in negotiating condom use with later sexual partners.

We wish to acknowledge the potential limitations implicit in our methodology. First, the event-specific methodology depends on the subjects' memory of their high-risk behavior at two points in time. We can only assume the accuracy of their memory of these events. Similarly, the retrospective nature of the family variable data is subject to distortion. We cannot be certain that the subjects' actual relationships with their parents were what they remember them to be. Finally, the lack of diversity in our sample limits the generalizability of our results.

Conclusion

Our results highlight the importance of family variables to safer sex behavior, particularly the influence of same-sex parents on their pre-teen's future condom use. Early intervention involving family may help shape beliefs that foster more protective, responsible sexual behavior. More broadly, the findings identify the need to expand theoretical models currently underlying intervention efforts to include factors, such as family, that shape the beliefs used to guide sexual decisions. A better understanding of these factors will improve the possibility of creating a safer sexual world for adolescents and young adults.

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FACING FACTS: HIV Prevention and Sexual Health

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Introduction

Today's teenagers never knew a world without AIDS. The statistics are frightening: it is estimated that one half of all new HIV infections in the United States are among people under 25 (Centers for Disease Control and Prevention [CDC], 1998b); one in four sexually active teens will have a sexually transmitted disease this year (Eng & Butler, 1997). The proportion of AIDS cases among adult/adolescent females in the U.S. has tripled since 1985 (CDC, 1998a). In 1996, AIDS cases in rural areas represented 6.7% of all AIDS cases in the United States (CDC, 1996).

Adolescent sexuality has changed dramatically during the past 40 years. In the 1950s, petting was the most common intimate teenage sexual experience, adolescents reached physical maturity later and married earlier, and teenage intercourse was uncommon except among the oldest and often engaged or married adolescents (Haffner, 1995). Patterns of sexual behavior differed widely between young men and young women, as well as among youth from different backgrounds.

Today's teenagers reach physical maturity earlier and marry later. There has been a steady increase in the percentage of young people having sexual intercourse, and in the percentage doing so at younger and younger ages (Haffner, 1995). Almost all teenagers experiment with some type of sexual behavior. Patterns of sexual activity are now fairly similar between young men and women, and young people from different ethnic, socioeconomic, and religious groups.

There is public and professional consensus about what is sexually unhealthy for teenagers. Professionals, politicians, and parents across the political spectrum share a deep concern about unplanned adolescent pregnancy; out-of-wedlock childbearing; sexually transmitted diseases (STDs) including AIDS; sexual abuse; date rape; and the potential negative emotional consequences of premature sexual behaviors.

However, there is little public, professional, or political consensus about what is sexually healthy for teenagers. The public debate about adolescent sexuality has often focused on which sexual behaviors are appropriate for adolescents, and ignored the complex dimensions of sexuality. The "just say no" approach to adolescent sexuality believes that the only healthy adolescent sexuality is abstinence from all sexual behaviors until marriage, and that adults should work to eliminate teen sexual experimentation. The "just say not now" philosophy encourages young people to abstain until they are more mature, but given the high rates of teenage sexual involvement in intercourse, recommends that young people have access to contraception and condoms whether or not adults approve of their behavior. Other adults adopt a "don't ask, don't tell" posture and simply pretend that adolescent sexuality and sexual behavior do not exist.

This adult difficulty acknowledging teenagers' emerging sexuality may actually increase teenagers' risk of pregnancy and sexually transmitted diseases. The majority of adults disapprove of teenagers having intimate sexual relationships, and adolescents often perceive this disapproval. Many teenagers are willing to risk pregnancy and disease rather than damage their "reputation" with their parents or experience the disapproval of adults with whom they must interact to obtain contraceptives and condoms.

In 1994, SIECUS convened the National Commission on Adolescent Sexual Health. Following eighteen months of deliberations, the Commission issued a report calling for a new approach to adolescent sexual health. Society has a responsibility to help adolescents understand and accept their evolving sexuality and to help them make responsible sexual choices, now and in their future adult roles. The Commission believes that adults must focus on helping young people avoid unprotected and unwanted sexual behaviors rather than asking them to abstain from all sexual behaviors. Individual adults and society in general must help adolescents develop the values, attitudes, maturity, and skills to become sexually healthy adults. The Commission developed a Consensus Statement on adolescent sexual health (see page x), which has been endorsed by 53 national organizations, including the Society for Adolescent Medicine, the American Medical Association, and the American College of Obstetrics and Gynecology (Haffner, 1995).

The very words "sexual health" are an oxymoron in America. Most adults in America live with a dark box of shame, guilt, fear, ignorance, and history of negative sexual experiences that affect their ability to be in intimate relationships, their ability to deal with policy issues around sexuality issues, and the way they approach their clients and students. Most adults say that they want something else for their children.

1) ADOLESCENTS ARE NOT THE PROBLEM; ADULTS ARE.

The 1997 Institute of Medicine Report, "The Hidden Epidemic," calls for a "significant national campaign to foster social change toward a new norm of healthy sexual behavior" (Eng & Butler, 1997). America is not sexually healthy;

Americans hold both confused and contradictory attitudes about sexuality. The senior author of this paper has described America as "moderately erotophobic." Americans, in general, are relaxed enough to participate in sexual behaviors but not accepting enough to do so without guilt or shame, and often without a commitment to prevention. This cultural confusion about sexuality is especially profound when it comes to adults' understanding and coping with adolescent sexuality and sexual behaviors.

Adults do not model sexual health for young people. Teenagers behave similarly to adults when it comes to their sexuality; indeed, in some cases, they behave more responsibly. For example, half of all pregnancies in the U.S. are unintended, and 75% of unintended pregnancies occur to adult women (Brown & Eiseberg, 1995). Never married teens use birth control more consistently than never married young adults in their 20s , and adolescents are more likely to use condoms than older couples (The Alan Guttmacher Institute [AGI], 1990).

Further, adults are actually responsible for much of the morbidity related to adolescent sexual behavior. For example, a history of sexual abuse in childhood is the single biggest predictor of adolescent pregnancy. Nearly three-quarters of young women who had intercourse before age fourteen report having had intercourse involuntarily (AGI, 1994). Sixty percent or more of all teen births are fathered by an adult male (Males, 1996). Nearly all sexually transmitted HIV among teens - male and female - is contracted from sex with an adult male (Males, 1996).

2)FORMING A SEXUAL IDENTITY IS A KEY DEVELOPMENTAL TASK OF ADOLESCENCE

Discussions about adolescent sexuality often are predicated on an adult perception of how "things should be," rather than on an appreciation of the dynamics and goals of adolescent development and maturation.

Adolescence is the time when young people develop the knowledge, attitudes, and skills that become the foundation for psychologically healthy adulthood. Adolescence is a period characterized by rapid changes and the need to achieve many significant developmental tasks. Nevertheless, far from being a time of great conflict and distress, the majority of adolescents pass through adolescence successfully. Children who enter adolescence with the most social or psychological disadvantages are likely to experience the greatest difficulties. Indeed, it may be that the greatest barrier to healthy development is a lack of education and economic opportunities (Peterson & Leffert, 1994).

Sexual self-concept, an individual's evaluation of his or her sexual feelings and actions, develops during adolescence. Young people develop a stronger sense of gender identity: they understand and more clearly identify as men and women. An understanding of one's sexual orientation also develops during adolescence: young people become more aware of their sexual attractions and love interests, and adult- like erotic feelings emerge. Sexual experimentation is common among all groups of adolescents.

During adolescence, young people solidify their gender identification by observing the gender roles of their parents and other adults. Gender identification includes understanding that one is male or female and the roles, values, duties, and responsibilities of being a man or a woman. Most young people have a firm sense of their maleness or femaleness prior to adolescence, but in adolescence, clear identification with adult masculine and feminine models emerge. It is essential that adolescents have men and women in their environments who convey the values, behaviors, and attitudes of appropriate gender role models. By interacting with psychologically healthy adult men and women, adolescents learn who they are and how to behave in appropriate ways.

Gender role stereotypes impede both young men and young women in attaining sexual health. Young women may learn that "it is better to be cute and popular than smart," "girls have few sexual feelings," and "girls who carry condoms are bad." Boys may learn that "real men are always ready for sex," and that "guys should never act like girls." One study found that teenage males who agree with traditional cultural messages about masculinity are more likely than other young men to use condoms less consistently (or not at all), and to say that if they made a partner pregnant, they would feel like a "real man"; they are less likely to think men share the responsibility for preventing pregnancy (Pleck, Sonenstein, & Leffert, 1993).

It is important to note that although patterns of sexual involvement are increasingly similar for boys and girls, persistent gender stereotypes mean that young women still experience their sexual behaviors quite differently. In a 1994 poll, young women reported that they were more likely to regret their sexual experiences, more likely to label the relationship "love," less likely to report their sexual experiences as pleasurable, and more likely to bear the brunt of negative outcomes than their male counterparts (Roper, Starch Worldwide, 1994).

One's sexual orientation often emerges in adolescence. In one study of students in grades 7-12, 88% of teenagers described themselves as predominantly heterosexual, 1% described themselves as bisexual or predominantly homosexual, and 11% were "unsure" of their sexual orientation. Uncertainty about sexual orientation diminished with chronological age; 26% of the 12-year-olds were "unsure" compared with only 5% of the 18-year-olds (Remefedi, 1992).

In retrospective studies, many gay and lesbian adults identify adolescence as a period of confusion about their sexual identity. Although a majority of adult gay men recall feeling different as children (Bell & Weinberg, 1981), most did not self-identify as gay until their late teenage years. Gay males begin to believe that they might be homosexual at an average age of seventeen years; lesbians at an average of eighteen. Gay males act on their homosexual feelings at a mean age of 17 years while lesbians report an average age at first genital sexual experience at 20 (Bell & Weinberg, 1981). "Coming out," or sharing one's sexual orientation with others, generally does not occur until adulthood (Haffner, 1995).

According to the National Commission, a sexually healthy adolescent is not defined by which behaviors a teenager has tried; rather sexually healthy adolescents appreciate their own bodies, communicate effectively with their families, interact with both genders in appropriate and respectful ways, and express love and intimacy in a developmentally appropriate manner.

3)SEXUAL BEHAVIOR AMONG ADOLESCENTS IS NEARLY UNIVERSAL

Although policy debates have tended to focus on sexual intercourse and its negative consequences, young people explore dating, relationships, and intimacy from a much wider framework. Sexual behavior is almost universal among American adolescents. A majority of American teenagers date. Eighty-five percent of American teenagers have had a boyfriend or girlfriend; 85-90% of American teenagers have kissed someone romantically; and 79% have engaged in "deep kissing" (Coles & Stokes, 1985; Roper, Starch Worldwide, 1994).

The majority of adolescents move from kissing to other more intimate sexual behaviors during their teenage years. More than half of all teenagers have engaged in "petting behaviors." By the age of 14, more than half of all boys have touched a girl's breasts, and a quarter have touched a girl's vulva (Coles & Stokes, 1985; Roper, 1994). By the age of eighteen, more than three quarters have engaged in heavy petting (Roper, Starch Worldwide, 1994). One quarter to one half of young people reporting experience with fellatio and/or cunnilingus (Coles & Stokes, 1985; Newcomer & Urdy, 1985).

Some research suggests that the progression from kissing to non coital behaviors to intercourse differs among different groups of adolescents. While many teenagers move through a progression of intimate behaviors, lower-income teenagers are less likely to follow this progression, moving more rapidly from kissing directly to sexual intercourse (Brooks-Gunn & Furstenberg, 1990).

4)TEENAGERS NEED SUPPORT FOR ABSTINENCE

Reference?? The National Commission on Adolescent Sexual Health encouraged young people to delay engaging in penetrative sexual behaviors until they are physically, cognitively, and emotionally ready for a mature sexual relationship. One quarter of teens have had intercourse at least once by age 15 (CDC, 1994) and nearly three quarters report doing so involuntarily (AGI, 1994). In a mid-1990s telephone survey, 65% of teen girls and 45% of teen boys thought their first sexual experiences happened too early (Roper, Starch Worldwide, 1994). It is imperative that young people receive education about intimacy, sexual limit setting, resisting social, media, peer, and partner pressure, and the benefits of abstinence.

However, professionals need to recognize that the antecedents of early first intercourse may not be malleable by traditional sexuality education or clinic programs. For example, young people who begin intercourse early are more likely to experience early pubertal development, including an earlier age of menarche and higher testosterone levels (Moore, Miller, Glei, & Morrison, 1995). Their mothers have lower education, and they are more likely to live in a single parent household (Moore, Miller, Glei, & Morrison, 1995). They are much more likely to be poor (AGI, 1994).

Certain other antecedents to early first intercourse could be affected by innovative approaches, including counseling and mentoring. Young people who begin intercourse early tend to have lower grades in school, low church attendance, and a lack of parental support. They are more likely to be depressed and involved in other problem behaviors, such as alcohol, tobacco, drug use, school problems, and delinquency. They are more likely to be dating at an early age, in a steady relationship, and believe that their friends and siblings are having intercourse. They tend to believe in traditional gender role stereotypes (Moore, Miller, Glei, & Morrison, 1995).

5)TEENAGERS CAN ENGAGE IN SEXUAL RELATIONSHIPS RESPONSIBLY

Despite the public impression to the contrary, most teenagers who have intercourse do so responsibly. More than 80 percent of Americans first have intercourse as teenagers. More than half of women and almost three quarters of men aged 15-19 have had sexual intercourse (AGI, 1994). However, despite the large numbers of young people who experiment with a variety of sexual behaviors, intercourse is generally less widespread and certainly less frequent than many teenagers and adults believe.

The majority of young people who are engaging in sexual intercourse are in middle and late adolescence. The average age for first intercourse is sixteen for boys and seventeen for girls, just one year younger than the average age in 1970 (AGI, 1994). The majority of sexually involved young people report that they do not feel partner or peer pressure, and the majority are in love with their partner (Roper, Starch Worldwide, 1994).

The majority of young people who are sexually involved use contraception as consistently and effectively as most adults. In 1979, fewer than half of the adolescents used a contraceptive at first intercourse; in 1988, two-thirds did so (Zelnik & Shah, 1983; Forrest & Singh, 1990). By 1990, that proportion had increased to more than 70 percent (National Center for Health Statistics, 1995). Recent surveys suggest that as many as two-thirds of the teenagers now use condoms; these proportions are 2-3 times higher than those reported in the 1970s (CDC, 1992). Almost 55% used a condom at last intercourse (CDC, 1996). However, in every survey, fewer than half of the teenagers who recently used condoms did so all of the time (Cates, 1991).

The Commission recommended that adults talk to teens about pleasure and desire and how to evaluate their readiness for a mature sexual relationship. In a recent book, Thompson (1995) found that the more realistic girls were about romance, the more they understood and anticipated pleasure, and the more their mothers had told them that sexual relationships were pleasurable, the more likely they were to be in consensual relationships and the more likely they were

to use protection. The more they were afraid or viewed sex, reproduction and love as fused, the less likely they were to use protection. Thompson concludes that fear doesn't stop teenage sex, it just leads to more "swept away" with "all its tragic sequels" (Thompson, 1995, page 204).

6)SOME FEDERAL AND STATE POLICIES DENY YOUNG PEOPLE THE INFORMATION THEY NEED

Young people are not receiving the sexuality information they need to make responsible sexual decisions. A 1993 survey by SIECUS (Gambrell & Haffner, 1993) found that the topics least likely to be covered by state sexuality education curricula are those that deal with sexual behaviors. Only fourstates cover human sexual response; only nine cover shared sexual behaviors; and only ten address masturbation. Only 13 states include information about sexual identity and orientation.

Many programs do not include complete information about pregnancy and disease prevention. Only ten states include clear contraceptive messages for high school students (Gambrell & Haffner, 1993). Only five state HIV/AIDS prevention curricula included practical information about condom use (Britton, DeMauro, & Gambrell, 1991). Indiana, like many other states, requires that AIDS education be taught in school, but does not require sexuality education. Any sexuality or AIDS education that is done in the state must teach about abstinence, but is not required to teach about contraception or STD/HIV prevention beyond abstinence. In a more recent study by the Centers for Disease Control and Prevention (Collins, Leavy, Kann, et al., 1995), the "correct use of condoms" was taught by only one third of HIV educators in schools. It was the topic least likely to be covered.

Although the majority of adults support school-based sexuality education, there still exists considerable community controversy over the content of such education. (Kantor, 1994). During the past six school years, SIECUS has identified more than 635 community controversies in every state about the content of programs. In many of these communities, opponents of comprehensive sexuality education have sought to replace it with what SIECUS has labeled "fear-based education." These programs are designed to scare young people from sexual behaviors: they withhold needed information, contain misinformation about contraception and disease prevention, and use scare tactics.

In September 1996, Congress authorized a new abstinence-only effort in the welfare report bill. The federal government, beginning in October 1997 and continuing through 2000, will
provide $50 million federal dollars for programs with the "exclusive purpose" to "teach the social, psychological, and health gains to be realized by abstaining from sexual activity." The law states that programs must teach that "a mutually faithful monogamous relationship is the expected standard of human sexual activity" and that "sexual activity outside of marriage is likely to have harmful psychological and physical effects." The National Institutes of Health Consensus Panel on AIDS said in February 1997 that the abstinence-only approach to sexuality education "places policy in direct conflict with science and ignores overwhelming evidence that other programs are effective" (National Institutes of Health, 1997, page 9)).

7)AMERICA NEEDS A NEW PARADIGM FOR MORAL SEXUAL RELATIONSHIPS

The expressed norm of non-marital chastity has never actually been the norm in America. For example, fewer than 7% of men and 20%of women aged 18 to 59 were virgins when they were married. Only 10%of adult men and 22%of adult women report that their first sexual experience was with their spouse (Laumann, Gagnon, Michael, & Michaels, 1994). Indeed this "norm" was probably never true: a third of all Pilgrim brides were pregnant when they were married (D'Emilio & Freedman, 1988). Further, there are currently more than 74 million American adults who are classified as single because they have delayed marriage, decided to remain single, are separated or divorced, or have entered into a gay and lesbian relationship. More than three quarters of these men and two thirds of these women have had sex with a partner in the past 12 months (Laumann, Gagnon, Michael, & Michaels, 1994).

SIECUS has suggested a new paradigm for moral, ethical sexual relationships that was endorsed by the National Commission on Adolescent Sexual Health (Haffner, 1995). A moral sexual relationship shares five characteristics. It is consensual, non-exploitative, honest, mutually pleasurable, and protected against STDS and pregnancy if any type of intercourse occurs. These criteria are the same for adults and adolescents, gays and straights, and single people and married partners.

PROFESSIONALS WORKING IN HIV EDUCATION

SIECUS (Haffner, 1995) encourages all professionals to consider the role that they play in promoting adolescent sexual health.

First, professionals need training to increase their comfort level in working on sexual health issues and to increase their skills in sexual behavior counseling.

Second, professionals must become actively involved in supporting comprehensive sexuality education programs in their community. Professionals have an important role to play as outspoken advocates for comprehensive sexuality education, including writing letters to the editor, voting in school board elections, writing supportive letters to teachers and administrators, and serving on community advisory committees. This involvement will help assure that the young people in the community have access to effective programs.

Third, it is important to reach out to parents of adolescents. Many parents are frightened by their children's adolescence, and too many start to pull back and feel that they no longer have a role in their children's lives. Many professionals are in the position to reach out to parents with educational programs. Parents need information on the predictable stages of adolescence and how to stay involved with teens

social and dating lives.

Fourth, HIV/AIDS professionals can work in coalition with others to advocate for comprehensive sexuality education. A wide range of organizations support comprehensive sexuality education and are willing to advocate on its behalf. The National Coalition to Support Sexuality Education is a coalition of over 115 national organizations that support comprehensive sexuality education. Many of these organizations have affiliates in your state or community.

Fifth, professionals must become politically involved on issues related to adolescent sexuality. A new federal program that provides states with half a billion dollars over the next five years to support highly restrictive abstinence-only-until-marriage education programs is dominating the debate on sexuality education in many states—professionals' voices must be heard. Consider becoming a SIECUS Advocate, a network of individuals advocating for sexuality issues within their communities and states.

Sixth, professionals must fight complacency around HIV/AIDS. Recent advances in the treatment of HIV disease and Magic Johnson's public statements about being cured of HIV have left many Americans with the false impression that they no longer have to worry as much about HIV/AIDS because it is curable, or at least manageable. HIV/AIDS educators need to continue to reinforce the message that prevention is the only cure we have.

Seventh, AIDS education is not just a job, but a vocation. All professionals need to educate the people in their lives. If each professional reaches out to 10 people a month in neighborhoods, churches and synagogues, families, and service organizations professionals could reach nearly everyone in America.

And finally, professionals must be courageous in defending young people's right to develop into sexually healthy adults. The prevailing political climate makes it difficult to advocate for much beyond abstinence for teens. The Far Right appeals to people's fears for young people. HIV/AIDS educators need to speak loudly about our hopes and dreams—a world where adolescence can be creative, fun, and exciting—a world where adults are honest with young people—a world where adolescence can be pregnancy-free, disease-free, violence-free and where every young person has the information, services, and support they need to grow up to be sexually healthy adults.

Consensus Statement On Adolescent Sexual Health

This statement reflects the consensus of the National Commission on Adolescent Sexual Health(Haffner, 1995).The Consensus Statement has been endorsed by more than 50 national organizations.

Becoming a sexually healthy adult is a key developmental task of adolescence. Achieving sexual health requires the integration of psychological, physical, societal, cultural, educational, economic, and spiritual factors.

Sexual health encompasses sexual development and reproductive health, as well as such characteristics as the ability to develop and maintain meaningful interpersonal relationships; appreciate one's own body; interact with both genders in respectful and appropriate ways; and express affection, love, and intimacy in ways consistent with one's own values.

Adults can encourage adolescent sexual health by:

- Providing accurate information and education about sexuality;
- Fostering responsible decision-making skills;
- Offering young people support and guidance to explore and affirm their own values; and
- Modeling healthy sexual attitudes and behaviors.

Society can enhance adolescent sexual health if it provides access to comprehensive sexuality education and affordable, sensitive, and confidential reproductive health care services, as well as education and employment opportunities. Families, schools, community agencies, religious institutions, media, businesses, health care providers, and government at all levels have important roles to play.

Society should encourage adolescents to delay sexual behaviors until they are ready physically, cognitively, and emotionally for mature sexual relationships and their consequences. This support should include education about:

- Intimacy;
- Sexual limit setting;
- Resisting social, media, peer, and partner pressure;
- Benefits of abstinence from intercourse; and
- Pregnancy and sexually transmitted disease prevention.

Society must also recognize that a majority of adolescents will become involved in sexual relationships during their teenage years. Adolescents should receive support and education for developing the skills to evaluate their readiness for mature sexual relationships. Responsible adolescent intimate relationships, like those of adults, should be based on shared personal values, and should be:

- Consensual;
- Non-exploitative;
- Honest;
- Pleasurable; and
- Protected against unintended pregnancies and sexually transmitted diseases, if any type of intercourse occurs.

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Relationship of HIV/STD Sexual Risk Behaviors to Other Health Behaviors Among a Sample of Indiana Rural Youth

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Abstract

Few studies correlating high risk sexual behaviors to other health behaviors among adolescents have been reported. This investigation, conducted in an Indiana rural community, examined associations between selected HIV/STD sexual risk behaviors and other health behaviors among 241 female and male tenth graders. These associations were contrasted to national data. Subjects completed a questionnaire that assessed whether they had engaged in eleven sexual risk and other health behaviors. Several health behaviors were associated with HIV/STD risk behaviors. The strongest associations with HIV/STD risk-increasing behaviors for both genders were the unhealthy behaviors. For the one HIV/STD risk-reducing behavior, condom use during last intercourse, those using the condom were less likely to engage in some of the unhealthy behaviors. Unique differences between the rural and national sample were found. The study suggests that altering HIV/STD risk behaviors may be achieved by decreasing other health risk behaviors.

By mid-year 1997, the Centers for Disease Control and Prevention (CDC) had recorded 33,634 AIDS cases for adolescents and adults living in rural counties of the United States. This represents 5.5 percent of all U.S. AIDS cases reported for adolescents and adults through June of 1997 (Centers for Disease Control and Prevention [CDC], 1997). Between 1991 and 1995, CDC AIDS surveillance data indicated an 80 percent increase in the rate of AIDS cases among Americans living in rural areas (CDC, 1992, 1995). As compared with their urban counterparts, rural Americans diagnosed with AIDS are more likely to have been infected at a younger age and as a consequence of heterosexual contact with an HIV-infected person (Roberts, Collmer, Wispelwey, & Farr, 1997; Rumley, Shappley, Waivers, & Esinhart, 1991; Rural Center for AIDS/STD Prevention, 1997).

More than 17 percent of all U.S. HIV infections probably occurred between the ages of 10 and 19 (CDC, 1997). Studies in Mississippi and Georgia have shown equal rates of HIV seroprevalence among rural and urban youth (Whyte & Carr, 1992; Young, Feldman, Bracklin, & Thompson, 1992). Additionally, one-quarter of all sexually transmitted diseases (STDs) in the U.S. are diagnosed among teenagers (Institute of Medicine [IOM], 1997). Some STDs are co-factors in the sexual transmission of HIV infection (Padian, Shiboski Glass & Vittinghoff, 1997).

Dryfoos (1990) synthesized data from previous studies and reported evidence supporting the hypothesis that adolescent health-related behaviors are correlated. Adolescent sexual behaviors were not studied. However, Dryfoos (1991) stated that HIV/STD risk behaviors may be associated with other risk behaviors that affect health and well-being. Boyer (1990) made a similar conclusion.

Previous research on correlations between health-related behaviors of urban and suburban adolescents and young adults has been conducted; however, none of these studies analyzed data by gender. Jessor, Donovan, and Costa's (1991) study of high school and college students found significant positive correlations among five behaviors: (a) drinking in the past six months, (b) marijuana use in the past month, (c) highest frequency of any illicit drug used in the past six months, (d) deviant behavior, and (e) number of cigarettes smoked per day in the past six months. The researchers postulated that some young people have multiple health-related risk behaviors, which they called syndrome of problematic behavior. Winnail, Valois, Mckeown, Saunders, & Pate (1995) reported correlations between health-related behaviors similar to those reported by Jessor et al. However, neither of these studies examined adolescent sexual behaviors.

Few studies on the correlations of high risk sexual behaviors to other risk behaviors among adolescents have been reported in the literature. Biglan et el. (1990) surveyed two samples of adolescents in grades eight through 12. Significant correlations were reported between risk sexual behavior and alcohol use and between high risk sexual behavior and cigarette use. Not using condoms was significantly correlated with alcohol use and cigarette use.

Lowry et al. (1994) reported data obtained from the 1990 Youth Risk Behavior Survey, a national study of adolescent self-reported health behavior conducted by the CDC, involving 11,631 students from a total of 124 schools. Of 54 percent who had experienced sexual intercourse, 44 percent of these students reported use of alcohol and/or cigarettes. Of 19 percent reporting four or more lifetime sex partners, 10 percent of these students also reported using alcohol and/or cigarettes, 30 percent reported using marijuana, and 46 percent reported using cocaine or another illicit drug. Alcohol and/or cigarette use, marijuana use, and cocaine or other illicit drug use was associated with ever having sexual inter-

course, having four or more lifetime sex partners, and not using a condom during last sexual intercourse.

Santelli et al. (1997) found among a national sample of young adults that demographic factors, risk behaviors and several protective factors were associated with condom use among adolescents using oral contraceptives. Both sexual and nonsexual risk behaviors were independently associated with lower rates of condom use. Further, associations between condom use and healthy behaviors were largely nonsignificant.

The possibility that risk behaviors share a common cause has been examined. Jessor et al. (1991) found evidence of a single underlying construct that accounted for relationships between risk behaviors among youth. Donovan, Jessor, and Costa (1991) postulated that problem behavior theory could be used to explain this single construct. Aaro, Laberg, and Wold (1995) reported evidence of two underlying constructs explaining the relationship of risk behaviors among youth. Resnick et al. (1997) reported findings from the National Longitudinal Study on Adolescent Health in which two factors were established to be protective against seven of the eight risk behaviors studied. High levels of parent-family connectedness and perceived school connectedness were protective of emotional distress, suicidal thoughts/behavior, cigarette use, alcohol use, marijuana use, violence, and early age of sexual debut. History of pregnancy was not predicted by either factor. If adolescent risk behaviors for HIV/STD infection are correlated with other risk behaviors, it is likely that similar underlying causes can be identified. Investigation of associations between sexual risk behaviors and other health behaviors among a sample of rural adolescents has not been reported. Rural youth may engage in more denial of HIV risk than their urban counterparts. This may be the consequence of less exposure to persons living with HIV/AIDS, belief in more conservative sexual norms, greater denial of the epidemic, and perception that people in rural areas know who is at risk for transmitting and acquiring HIV.

Preventing HIV infection and other STDs in the U.S. has been declared a national emergency (IOM, 1997). Understanding risk behavior of a target population is an initial step in developing effective HIV/STD prevention programs (CDC, 1996). The HIV/STD risk behaviors of rural adolescents have not been adequately studied. This investigation examined associations between selected HIV/STD sexual risk behaviors and other health behaviors of both genders of rural youth. We hypothesize that sexual risk behaviors would be associated with other health risk behaviors. Also, these associations were contrasted to similar data from the YRBS (CDC, 1993).

Methodology

Subjects

The subjects were limited to 241 students enrolled in tenth grade health science classes of a high school in a rural Indiana community. The community met the criterion for a rural county (50,000 population or less) utilized by CDC (CDC, 1997). Females and males comprised 53.5 percent and 46.5 percent of the sample, respectively. About 48 percent, 44 percent, and 7 percent of the sample was 15, 16, and 17 years or older, respectively. Ninety five percent of the sample were White with the remainder being either Oriental, Hispanic, Black, or Native American.

In the national sample, females and males comprised 48 percent and 52 percent of the sample, respectively. About 42 percent, 50 percent, and 8 percent were 15, 16, and 17 years of age or older, respectively. Sixty-six percent of the sample were White, 15 percent were Black, 11 percent were Hispanic, 4 percent were Asian, with the remainder either Native-American or other race.

Procedures and Instrumentation

Parent/guardian and student permission were required for student participation. The total parent and student refusal rate was less than five percent of the entire population. Data were collected during Winter, 1995. All students were administered the same paper-and-pencil questionnaire. The questionnaire assessed the frequency of eleven, self-reported health behaviors. The health behaviors and question wording (see Table One) were largely derived from the YRBS (CDC, 1993). To save space, an abbreviated form of each question was used in the script.

The questions included three items related to HIV/STD risk behavior: two items were risk-increasing (ever had sexual intercourse and had four or more lifetime sex partners) and one was risk-reducing (used condom during last intercourse). Four of the remaining items were health behaviors (seat belt use, exercise, sleep, ate fruits/vegetables) and four were unhealthy behaviors (cigarette use, alcohol use, alcohol/drugs use before sex, injection drug use).

Alcohol/drugs before sex and injection drug use were chosen as other risk behaviors rather than HIV risk behaviors. Literature indicates association between alcohol and risky sexual behavior is weak (Baker, Morrison, Gillmore, & Shock, 1995; Fortenberry, Orr, Katz, Brizendine, & Blythe, 1997; Leonard & Ross, 1997). Also, the problem of our study precluded classification of injection drug use as an HIV risk behavior because we examined only sexual risk behavior for HIV.

Students completed the questionnaire anonymously and in private during a regular class session, and deposited it in a collection box to protect confidentiality. Gender, ethnicity, grade level, and age were also assessed.

In order to make comparisons with a national sample, we analyzed data for 2746 tenth grade students completing the 1995 YRBS questionnaire. The 1995 YRBS questionnaire did not measure fruit/vegetable consumption as a single item or sleep; hence, comparison of these behaviors to the rural sample was not possible. Females and males comprised 48%

and 52% of the national sample, respectively. About 42% , 50% and 8% of the national sample was 15, 16, and 17 years or older, respectively. About 66% of the sample were White, 15% Black, and 11% Hispanic, with the remainder being Oriental, Asian, or Native American.

Data Analysis

A chi-square-based measure of association yielding a Phi coefficient was applied to determine if associations existed between each HIV/STD sexual risk behavior and each of the other health behaviors. Phi is an approximation of the Pearson Product Moment correlation. Descriptive data were converted to Z scores in order to compare the two samples.

Because correlations of dichotomous variables between the rural and national cannot be compared, we subjected the data to Fisher's Z prime transformation. Additionally, the chi-square test was conducted on all significant associations to determine differences in health behavior between those engaging and those not engaging in specific health behavior. Chi-square results are reported only for Phi coefficients of .30 or greater. Due to missing data, slight variations in percentage engaging in the behaviors may occur. Alpha was set at $p < .05$ for all the tests of significance.

Results

Adolescent Participation in HIV/STD Sexual Risk Behaviors

As shown in Table One, a little more than one-third of the rural sample reported ever having sexual intercourse, whereas about one-half of the national sample reported similar behavior. For this variable there were significant differences between the rural and national samples for both genders, with the number of national females and males ever having sexual intercourse being greater than rural females and males.

About one in ten rural females and males reported having four or more lifetime sexual intercourse partners, whereas one of ten and about two of ten national females and males, respectively, reported the same. The difference between rural and national males was significant with a greater percentage of national males having four or more lifetime sex partners.

For those ever having sexual intercourse, about six out of ten females and males of both samples reported using a condom during last sexual intercourse. There were no significant differences in this behavior for the two samples.

Adolescent Participation in Other Health Behaviors

The percentages of both the rural and national samples engaging in the other health behaviors are reported in Table One. As shown in the table, there were some significant differences in percentage of those participating in the behavior for both genders between the two samples.

Association Between Ever had Sexual Intercourse and Other Health Behaviors

As shown in Table Two, significant positive associations were established for rural females between ever having sexual intercourse and cigarette use, and alcohol use. Of 47 females who ever had sexual intercourse, 22 (47%) also reported cigarette use, and of the 81 females not having sexual intercourse, 8 (10%) used cigarettes. Of 47 females who ever had sexual intercourse, 24 (51%) also reported alcohol use, and of the 81 females not having sexual intercourse, 17 (21%) used alcohol.

For rural females, a negative association was found between ever having sexual intercourse and seat belt use. Of 47 females who ever had sexual intercourse, 11 (23%) also reported seat belt use, and of the 81 females not having sexual intercourse, 44 (54%) also used seat belts.

Similar significant positive and negative associations for females were found when the rural and national samples were compared, except for a significant negative association established for exercise in only the national sample. For females, no significant differences existed in the Phi coefficients between the rural and national samples.

As shown in Table Two, for rural males significant positive associations were established between ever having sexual intercourse and cigarette use, alcohol use, injection drug use, and ate fruits/vegetables. Of 41 males who ever had sexual intercourse, 22 (54%) also reported cigarette use, and of the 69 males not having sexual intercourse, 10 (15%) also used cigarettes. Of 41 males who ever had sexual intercourse, 24 (59%) also reported alcohol use, and of the 69 males not having sexual intercourse, 19 (28%) also used alcohol.

For rural males, negative associations were found between ever having sexual intercourse and seat belt use, and sleep.

Similar significant positive and negative associations for males were found for national males, with no significant differences existing in the Phi coefficients between the rural and national samples.

Association Between Having Four or More Lifetime Sex Partners and Other Health Behaviors

As shown in Table Three, significant positive associations were established for rural females between having four or more lifetime sex partners and cigarette use, alcohol/drug use before sex, alcohol use, injection drug use, and sleep. Of 12 females who had four or more sex partners, 9 (75%) also reported cigarette use, and of the 116 females not having four or more sex partners, 21 (18%) also used cigarettes. Of 12 females who had four or more sex partners, 5 (42%) also reported alcohol/drug use before sex, and of the 35 also reporting ever having sexual intercourse, 3 (9%) also reported alcohol/drug use before sex. Of 12 females who had four or more sex partners, 3 (25%) also reported injecting drug use, and of the 116 females who did not have four or more sex partners, 1

Table 1. Percentage of Rural and National Tenth Graders who Engaged in HIV/STD Sexual Risk Behaviors and Other Health Behaviors

Behavior	Rural[a,c]		National[a,c]	
	Female (n=129)	Male (n=112)	Female (n=1326)	Male (n=1419)
Sexual:				
Ever had sexual intercourse	**37**	**37**	**46**	**50**
Had sexual intercourse with four or more people during a lifetime	9	**11**	11	**20**
Used a condom during last sexual intercourse	57	58	54	65
Other Healthy:				
Always use safety belts when riding in a car or truck driven by someone else	**43**	30	**30**	31
Exercised or participated in sport activities that caused sweating and hard breathing during past seven days	53	**68**	59	**79**
Usually gets at least seven hours of sleep during school nights (Monday - Thursday)	67	67	[b]	[b]
Consumed five or more servings of fruit and vegetables yesterday	17	15	[b]	[b]
Other Unhealthy:				
Smoked cigarettes at any time during the past 30 days	**24**	26	**35**	31
Drank alcohol or used drugs before last sexual intercourse	17	41	21	34
Consumed alcohol during past 30 days	**33**	**40**	**49**	**50**
Ever injected illegal drugs during lifetime	3	**12**	2	**2**

[a]Bold represents a significant difference between the rural and national sample ($p < .05$, z test)
[b]Variables not measured in national sample
[c]Percentages were rounded

(1%) did not inject drugs. Of 12 females who had four or more sex partners, 3 (25%) also reported at least seven hours of sleep, and of the 115 females not having four or more sex partners, 83 (72%) also reported seven hours sleep.

For rural females, a negative association was found between having four or more sex partners and condom use. Of 12 females who had four or more sex partners, 3 (25%) also reported condom use, and of 35 reporting ever had sexual intercourse (fewer than four partners), 24 (69%) also used a condom.

In comparing the rural and national female samples, similar significant associations were found for cigarette use and alcohol use. Significant positive associations were established for alcohol drugs before sex and injection drug use for only the rural sample and negative significant associations were found for seat belt use and exercise for only the national sample. Phi coefficients were significantly stronger for females in the rural sample than those in the national sample for cigarette use, alcohol drug use before sex, injection drug use, and condom use.

As shown in Table Three, significant positive associations were established for rural males between having four or more sex partners and alcohol drug use before sex, and injection drug use. Of 12 males who had four or more sex partners, 8 (67%) also reported alcohol drug use before sex, and of the 29 not having four or more sex partners, 9 (31%) did not use alcohol drugs before sex. Of 12 males having sex with four or more partners, 5 (42%) also reported injection drug use, and

Table 2. **Associations Between Ever Had Sexual Intercourse and Other Health Behaviors for a Rural and National Sample of Tenth Graders**

	Rural		National	
Ever Had Sexual Intercourse	Female (n=129)	Male (n=112)	Female (n=1326)	Male (n=1419)
Other Health Behavior:				
Seat Belt Use	-.30*	-.22*	-.17*	-.18*
Exercise	-.04	-.04	-.14	-.03
Sleep	-.13	-.19*	—[b]	—[b]
Ate Fruits/Vegetables	-.13	.19*	—[b]	—[b]
Cigarette Use	.42*	.42*	.31*	.32*
Alcohol/Drugs before sex	—[a]	—[a]	—[a]	—[a]
Alcohol Use	.31*	.30*	.25*	.27*
Injection Drug Use	.14	.21*	.04	.14*

[a]Insufficient n to conduct test of significance
[b]Variables not measured in national sample
* $p < .05$

Table 3. **Associations Between Four or More Lifetime Sex Partners and Other Health Behaviors for a Rural and National Sample of Tenth Graders**

	Rural		National	
Four or More Lifetime Sex Partners	**Female** (n=129)	**Male** (n=112)	**Female** (n=1326)	**Male** (n=1419)
Other Health Behavior:				
Seat Belt Use	-.17	-.04	-.12*	-.17*
Exercise	-.10	-.01	-.12	-.01
Sleep	-.30*	.06	—[a]	—[a]
Ate Fruits/Vegetables	-.08	.07	—[a]	—[a]
Cigarette Use	**.39***	.16	**.19***	.28*
Alcohol/Drugs Before Sex	**.38***	.33*	**.06**	.23*
Alcohol Use	.23*	.20	.20*	.20*
Injection Drug Use	.40*	.35*	**.07**	.19
Condom Use	**-.38***	**-.60***	**-.04**	**.06**

[a]Variables not measured in national sample
[b]Bold represents a significant difference of Phi coefficients between rural and national sample ($p < .01$, Fishers z prime transformation)
* $p < .05$

of the 98 males not having four or more sex partners, 7 (7%) also used injection drugs.

For rural males, a negative association was found between having four or more sex partners and condom use. Of 11 males having four or more sex partners, 1 (9%) used a condom, and of 29 males reporting ever had sexual intercourse (fewer than four partners), 22 (76%) also reported condom use.

In comparing the rural and national male samples, similar significant positive associations were established for alcohol/drug use before sex and injection drug use. A significant negative association was established for condom use for only the rural sample, and positive significant associations were found for cigarette use and alcohol use and a significant negative association was established for seat belt use in only the national sample. The Phi coefficient for condom use was significantly stronger for rural males than for national males.

Association Between Condom Use and Other Health Behavior

As shown in Table Four, a significant positive association was established for rural females between condom use and exercise. Of 27 females who used condoms, 18 (67%) also exercised, and of the 19 females not using condoms, 5 (26%) also exercised.

For rural females, negative associations were found between condom use and cigarette use, and alcohol/drug use before sex. Of 27 females who used condoms, 9 (33%) also reported cigarette use, and of the 20 females not using condoms, 13 (65%) also smoked cigarettes.

In comparing the rural and national female samples, a similar significant negative association was found for alcohol/drug use before sex. A significant negative and positive association was found for cigarette use and exercise, respectively, for only the rural sample, and significant positive associations were established for seat belt use and injection drug use for only the national sample. The Phi coefficient for exercise use was significantly stronger for rural females than for national females.

As shown in Table Four, a significant negative association was established for rural males between condom use and injection drug use. Of 23 males who used condoms, none injected drugs, and of the 17 males not using condoms, 8 (47%) also injected drugs.

In comparing the rural and national samples for males, no similar significant associations occurred. A significant negative association was found for injection drug use for only the rural males, and significant negative associations were found for alcohol/drug use before sex and exercise for only the national males. The Phi coefficient for injection drug use was significantly stronger for the rural males than for the national males.

Discussion

Results indicate that several health behaviors among this sample of Indiana rural tenth graders were associated with HIV/STD risk behaviors. For the HIV/STD risk-increasing behaviors (ever had sexual intercourse and four or more lifetime sex partners), the most common and powerful associations for both genders were the unhealthy behaviors: ciga-

Table 4. Associations Between Condom Use and Other Health Behaviors for a Rural and National Sample of Tenth Graders

	Rural		National	
Condom Use	**Female** (n=129)	**Male** (n=112)	**Female** (n=1326)	**Male** (n=1419)
Other Health Behavior:				
Seat Belt Use	.27	.00	.11*	.04
Exercise	**.40***	.05	**.02**	-.10*
Sleep	.17	-.14	—[a]	—[a]
Ate Fruits/Vegetables	.02	.03	—[a]	—[a]
Cigarette Use	-.31*	-.27	-.05	.02
Alcohol/Drugs Before Sex	-.29*	-.18	-.18*	-.12*
Alcohol Use	-.06	-.08	.07	.04
Injection Drug Use	-.13	**-.58***	-.15*	**.05**

[a]Variables not measured in national sample

[b]Bold represents a significant difference of Phi coefficients between rural and national sample ($p < .01$, Fishers z prime transformation)

*$p < .05$

rette use, alcohol use, alcohol/drug use before sex, and injection drug use. For example, about four times more females and males who ever had sexual intercourse smoked cigarettes in the last 30 days than those never having intercourse. Compared to those never having sexual intercourse, about two times more females and males who ever had sexual intercourse drank alcohol in the last 30 days. For those having had four or more lifetime sex partners, about four times more females smoked cigarettes than those not having four or more partners. About four times and two times more females and males, respectively, with four or more lifetime sex partners used alcohol/drugs before sex than those not having four or more partners. Further, females and males, respectively, with four or more lifetime sex partners, were about three times and eight times less likely to use a condom during last intercourse than those not having four or more partners. This finding may be a consequence of having multiple sex partners and never experiencing fear or symptoms of HIV/STD. Thus, the lack of symptoms after several partners may boost feelings of invulnerability to HIV/STD. Weinstein (1989) has termed this phenomenon the absent-exempt hypothesis.

For the one HIV/STD risk-reducing behavior, condom use during last sexual intercourse, those using the condom were less likely to engage in some unhealthy behaviors. For example, females who used condoms were two times less likely to smoke cigarettes than those who did not. Males using condoms were 47 times less likely to inject drugs than those not using the condom. The frequent associations of cigarette use and alcohol use with HIV/STD risk behaviors concur with findings of Biglan et al. (1990) who established associations of similar direction and magnitude as those reported here. The findings of this study for condom use also support the results of Santelli, et al. (1997). In general, healthy behaviors were only sporadically associated with the HIV/STD risk behaviors.

Few differences in significant associations between HIV/STD risk behaviors and other health behaviors were found when the rural and national samples were compared. One striking exception was that a significant difference in the strength of the association between condom use during last intercourse and having four or more sex partners was found between the rural and national samples. Compared to the national sample, rural adolescents of this study were at elevated risk for HIV/STD infection because of their greater tendency for those having multiple partners not to use condoms during last intercourse. Also, the comparison of the rural and national samples revealed that the percentage of rural adolescents engaging in many of the health behaviors examined in this study is similar to the national sample. In contrast to popular perceptions that young people in rural areas are protected from health risks, this study indicated that rural adolescents engage in at least as many health risk behaviors as the national sample.

The associations established in this study pose a critical question: are the relationships direct or are they caused by a third variable? Based on problem-behavior theory and previous work by Jessor et al. (1991) and Donovan et al. (1991), it is possible that the associations reported in this study are caused by at least one underlying construct which may be represented as "risk syndrome." Figure One illustrates a risk syndrome model which may be used to conceptualize the relationship of risk behaviors to one another and to the construct (risk syndrome) that may serve as the "root" of problem-behaviors. To illustrate this model with an important finding of this study, the figure shows that smoking cigarettes and ever having sexual intercourse results from the risk syndrome, but not from each other. Also, all but one significant association established in this study was predictable by the risk syndrome model.

Overall, a greater number of significant associations between HIV/STD risk behaviors and other health behaviors were established for the females of this study than for the males. Apparently, females who place themselves at risk for HIV/STD infection engage in a variety of behaviors typically identified with "bad girls." The same was not true for males, possibly reflecting the double standard.

This study had several limitations. First, the questionnaire constructed for this study was designed to assess basic health practices, not in-depth behavior. For example, the question concerning ever having had sexual intercourse did not assess whether condoms were used, although ever having intercourse was considered in this study to be a HIV/STD risk-increasing behavior. Another limitation was the self-report nature of the questionnaire. Self-reporting of sexual behavior may not be accurate as studies indicate that females tend to under-report and males tend to over-report sexual activities (Turner, Miller, & Rogers, 1997). Also, the rural sample was derived from only one community that created a small sample size which resulted in low reported frequencies for some health behaviors.

The study showed strong associations between several unhealthy behaviors, such as HIV/STD risk behavior, cigarette smoking, and alcohol use, implying that certain risk behaviors are affiliated. Education efforts to decrease the incidence of a particular risk behavior; e.g., cigarette smoking, may actually decrease HIV/STD risk-increasing behavior by altering the risk syndrome discussed previously (see Figure 1). Therefore, HIV/STD prevention education might be more effective as part of a broad-based health education program. Future research should determine effective education to prevent smoking also decreases HIV/STD risk-increasing behavior.

Acknowledgment

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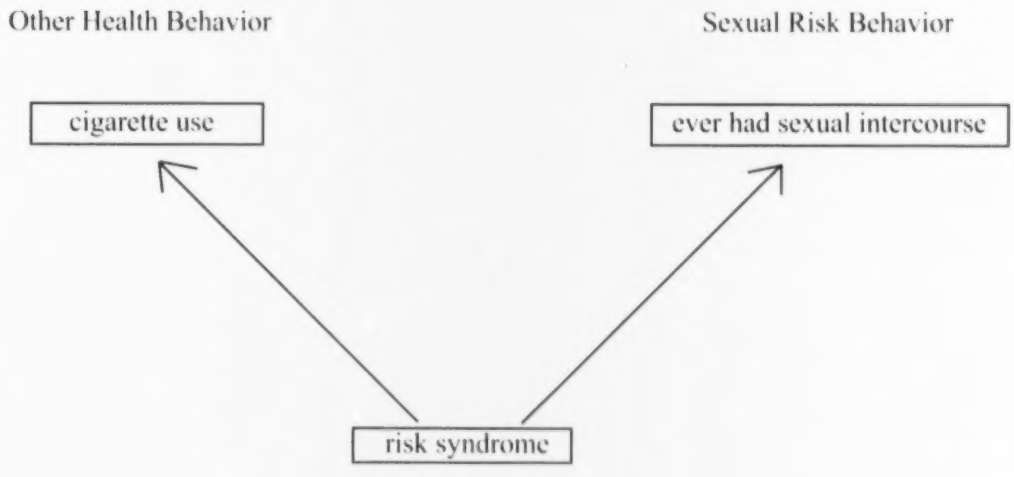

Fig. 1. Cigarette use and ever had sexual intercourse as an illustration of the spurious relationship between other health behaviors and sexual risk behaviors.

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Managing Drug Resistance to Antiretroviral Therapy for HIV Infected Patients

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Abstract

Combination drug therapies have resulted in a significant decline in AIDS-related deaths in the U.S. However, the inherent ability of the HIV virus to develop drug resistance represents the major obstacle to the long-term efficacy of antiretroviral therapy. The objectives of this paper are to present the results of two studies related to the management of HIV infected patients. The first study is a survey of the practice patterns of 1798 physicians who treat HIV patients. A total of 644 (35.8%) surveys were returned. The second study uses computer simulation to analyze the effects of noncompliance with treatment regimens. The results of the survey indicate that only 67 percent of the physicians identified appropriate therapy based on the NIH guidelines for treatment-experienced patients and only 54 percent chose the correct treatment for a treatment-naive pregnant patient. Eighty-six percent of the physician respondents cited patient failure to adhere to treatment regimens as a major barrier to optimal management of HIV. Based on the survey and current data from the Center for Disease Control and Prevention [CDC], the computer simulation model predicts that by the year 2002 almost a third of the AIDS population may be infected with drug resistant strains of the virus. Drug resistance in turn leads to treatment failure and earlier progression to death. The studies suggest that compliance with treatment is a significant factor in the spread of AIDS. New treatments that are easier for patients to follow and behavioral interventions that reduce noncompliance could significantly reduce the spread of resistant strains of the HIV virus.

Incidence of AIDS and Related Deaths

Combination antiretroviral therapy with inclusion of protease inhibitors has been shown to reduce morbidity and mortality due to acquired immune deficiency syndrome (AIDS) (Hammer et al, 1996). In 1994, only 25 percent of AIDS patients were prescribed more than one antiretroviral drug. By 1997, two years after the introduction of protease inhibitors, the majority of patients were receiving combinations of antiretroviral drugs including a protease inhibitor (Palella et al., 1998).

As a result of the new therapeutic regimens, AIDS and deaths declined from the first half of 1995 to the first half of 1996 by 9 percent and 14 percent, respectively. From the first half of 1996 to the first half of 1997, AIDS declined 12 percent, deaths declined 44 percent (CDC, 1997a; Fleming et al., 1998). The CDC report concluded that these declines principally reflect the impact of treatment-induced delays in progression from HIV to AIDS and increased survival after AIDS is diagnosed.

Management of HIV

Consensus statements on management of HIV-infected patients have been developed and disseminated (Carpenter et al., 1996; CDC, 1998). Treatment involves initiation of therapy early in the progression of the disease with two non-nucleoside reverse transcriptase inhibitors and one protease inhibitor. The goal of treatment is to maintain immune function in as normal a state as possible, to prevent progression of the HIV disease, to preserve quality of life, and to prolong life. In order to accomplish these goals, plasma HIV RNA levels (i.e., the number of HIV particles circulating in the blood) need to be reduced below the level of detection in order to prevent irreversible immune system damage (Gulick, R. M., Mellors, J.W., Havlir, D., Eron, J.J., Gonzalez, C. McMahon, D., Richman, D.D., 1997).

While these new combination drug therapies initially have proven to be highly successful, a number of problems exist (CDC, 1997b). There is no evidence that treatment can totally eradicate the HIV virus. If treatment is stopped, the virus rebounds from other areas such as lymph nodes. Also, the effectiveness of the new therapies has only been studied for a few years. It is still not known how long the combination of drugs can suppress HIV levels in the blood. The drugs are expensive. Combination regimens that include protease inhibitors cost $13,000 per year of life (Holtgrave and Pinkerton, 1997). Therapy does not work for all patients and frequently patients experience side effects.

Additional problems arise if treatment fails or patients fail to adhere to their treatment regimens. The new therapies are complex. They require patients to take multiple medications a number of times a day for the rest of the patient's life. Patients who miss doses of their medications may develop drug-resistant strains of the HIV virus. These resistant strains of the virus can also be transmitted to others.

Physician knowledge and use of these guidelines has a

direct influence on the patient's prognosis. A study by Kitahata and others (1996) found a 43 percent lower death rate among HIV-infected patients who were treated by the most experienced physicians. The median survival of HIV-infected patients with the least experienced physicians was 14 months compared to 26 months for patients treated by the most experienced physicians.

Surveys have shown, however, that many primary care physicians evidence uncertainty concerning diagnosis and treatment of HIV-infected persons. One study of primary care physicians in the state of Texas found that the majority of physicians incorrectly rank-ordered the most prevalent risk factors for HIV infection in patients older than fifty years (Skiest and Keiser, 1997). A second study used standardized patients to assess the ability of primary care physicians to identify physical findings of HIV infection. The study found that only 26 percent of the physicians correctly evaluated Kaposi's sarcoma and 22 percent detected and correctly diagnosed oral hairy abnormalities (Paauw et al., 1995).

Adherence to Treatment Regimens

Lack of adherence to currently prescribed antiretroviral therapies is another problem. A CDC study of persons 18 years of age or older in 12 states found that a third of the respondents reported they did not always adhere to therapy. Ability to adhere to therapy lessened as treatment duration increased. The most frequent reasons given by patients for not taking their medications were "forgot," "can't work them into my schedule," and "side effects" (Nakashima, A.K., Jones, J.L., Burgess, D.A. & Ward, J.W., 1998).

A second study of HIV-infected patients at five clinical sites found that only 50 percent of the respondents thought they had properly taken 90 percent or more of their medication doses in the previous month. The investigators concluded that adherence programs are needed that address knowledge gaps about medication requirements, that promote skills in planning ahead and managing side effects, and that promote the development of support systems and safety nets (Kunches, L., Mazullo, J.M., Miller-Mack, E., Russell, M., & Ortega, Z., 1998).

A third multi-center study of adherence to multidrug therapy by 248 patients reported that 79 percent missed one or more doses of their drugs. Sixteen percent missed a dose in the last day; 26 percent missed one or more doses in the last three days; 22 percent reported that they took a "drug holiday" for one or more full days (Stone et al., 1998).

Noncompliance with drug-dosing regimens can lead to treatment failure and the development of drug-resistant strains of the HIV virus (Carpenter et al., 1996). Drug regimens that maintain high plasma concentrations are more effective in preventing the emergence of resistant HIV virus. Because resistance may be a consequence of suboptimal plasma drug concentrations, strict adherence to treatment regimens is important. In one study of compliance, resistance was associated with a high plasma viral load and episodes of poor compliance (Vanhove, G.F., Schapiro, J.M., Winters, M.A., Merigan, T.C. & Blaschke, T.F., 1996). Consequently, it is recommended that patients who have difficulty tolerating treatment regimens involving high doses of protease inhibitors stop taking all antiretroviral drugs. Also, physicians are advised to be cautious in prescribing these medications to patients who are known to have a history of poor compliance (Flexner, 1998).

These drug-resistant strains can be transmitted to uninfected individuals (Conlon et al., 1994). Individuals infected with resistant HIV strains also progress to AIDS and death earlier (Japour et al., 1995). In general, the ability of the HIV virus to develop drug resistance represents the major obstacle to the long-term efficacy of antiretroviral therapy (Coffin, 1995).

Objectives

In this paper we present the results of two studies related to the management of HIV infection. The first study is a survey of the current practice patterns of physicians in the U.S. who treat HIV-infected patients. The survey was based on the 1997 NIH clinical practice guidelines (Kristofco et al., 1998). The second study uses computer simulation to analyze the effect of noncompliance with treatment on the prevalence of multi-drug-resistant HIV strains (Anderson et al., 1998).

Methods

Survey

In November 1997, 1,798 physicians who were members of the International Association of Physicians in AIDS Care were surveyed to determine their current practice patterns in the management of HIV-infected patients. The survey instrument was based on the NIH guidelines for the use of antiretroviral agents in HIV-infected adults and adolescents (CDC, 1998). Six case scenarios were used to represent management of different types of HIV-infected patients. Also, physicians were asked to identify barriers to optimal management of HIV-infected patients. The survey was administered by FAX during October and November 1997 and readministered to non-respondents ten days later. A total of 644 (35.8%) physicians responded to the survey. Of these surveys, 629 were complete enough to include in the analysis.

Computer Simulation

A Computer simulation model was constructed using STELLA II simulation software (Hannon and Ruth, 1994). Parameters of the model are based on data from the CDC and the physician survey. The model is shown in Figure 1. The model is initialized with the U.S. population infected with AIDS in 1994. In the model, AIDS infected individuals are either compliant with their treatment regimens or are noncompliant. Noncompliant patients are at risk of developing a resistant strain of the HIV virus. Progression to death is

faster for those individuals who are resistant. Ultimately all AIDS infected individuals progress to death. The model simulates the U.S. AIDS population from 1994 to the year 2002.

Results

Practice Patterns

Of the respondents, 40.7 percent were family practitioners or general internists, 48.1 percent were infectious disease specialists. The other 11.2 percent of respondents were in other specialties. Over 90 percent of the respondents reported treating more than 20 HIV-infected patients in their practice.

Table 1 shows physician responses to the case scenarios. Ninety-four percent of the respondents correctly identified the appropriate therapy for a treatment-naive patient. This case involved a 30-year-old gay white male newly diagnosed as HIV-positive. He has a viral load of 200,000 copies RNA/ml but no other medical problems.

A second case involved treatment for a 40 year old white male who has been HIV-positive for five years. While he has a previous history of antiretroviral therapy, his last three viral loads have risen from 75,000 to 120,000 copies RNA/ml. In this case only 67 percent of the physicians selected the most

Figure 1.

Model of AIDS Prevalence, Compliance, and Drug Resistance

Table 1

Practice Patterns of Physicians who treat HIV/AIDS Patients

Type of Patient	Appropriate Therapy
Treatment-Naive	94%
Treatment-Experienced	67%
Treatment-Naive Pregnant	54%

appropriate therapeutic option for this treatment-experienced patient.

The third case required the physician to select the best treatment option for a 24-year-old pregnant white female who is infected with the HIV virus. She has no previous history of antiretroviral therapy. Only 54 percent of the physicians selected the most appropriate treatment for this patient.

Table 2 shows physician responses to a question concerning barriers to the optimal management of HIV/AIDS. Eighty-six percent cited patient failure to adhere to treatment regimens as a major obstacle. Other major barriers that physicians cited were the complexity of treatment regimens, side effects of the medications, and cost.

Simulation

The AIDS population in the U.S. was simulated over the time period from 1994 to 2002. Based on the survey of physicians who treat patients with HIV/AIDS it was assumed that only 30 percent of patients are assisted in developing behavioral strategies to improve adherence to their treatment regimens. The results of the simulation are shown in Table 3.

The model predicts that noncompliance with treatment will lead to a rapid rise in drug resistant strains of the HIV virus. By the year 2002 almost one-third of those infected with AIDS in the U.S. may be drug resistant. This has two consequences. First, it may lead to a significant increase in the prevalence of AIDS. By the year 2002 the model predicts that the prevalence of AIDS will increase 133 percent. There may be over 400,000 persons in the U.S. living with AIDS. Second, the cumulative number of deaths due to AIDS-related causes is predicted to increase significantly. While 281,175 persons had died from AIDS in 1994, total deaths is predicted to increase to over 660,000 by the year 2002.

Discussion

The survey indicated that the practice patterns of physicians who treat HIV-infected patients are consistent with the NIH guidelines when they diagnose and treat patients who

Table 2

Physician Perceptions of Barriers to Optimal Management of HIV/AIDS*

Perceived Barriers	Percentage
Patient Failure to Adhere to Regimens	86%
Complexity of Treatment Regimens	85.7%
Medication Side Effects	79.5%
Cost of Medications	59.8%
Lack of Patient Understanding of Treatment	28.9%
Lack of Physician Time with Patient	26.1%
Rapid Changes in Diagnosis and Treatment	24.1%
Language Barriers	19.1%
Lack of Office Staff Time	15.5%
Lack of Patient Education Materials	10.9%

*Respondents could choose more than one response

Table 3

Prevalence of AIDS, Drug-Resistance and Cumulative Deaths from AIDS

Year	Prevalent AIDS Cases	Percentage Drug Resistant	Cumulative Deaths
1994	175,000	0	281,175
1995	198,486	3.4	325,640
1996	228,833	10.3	364,839
1997	260,332	16.5	404,670
1998	191,252	21.5	447,314
1999	323,601	25.2	493,532
2000	355,072	28.0	544,736
2001	384,234	30.3	600,750
2002	409,125	32.4	661,060

have not been on antiretroviral therapy before. Physicians, however, demonstrated a less clear understanding of the more complex issues involved in selecting a treatment regimen for treatment-experienced and HIV-positive pregnant patients. Physicians also recognized the importance of adherence to treatment regimens as a critical obstacle to the successful management of HIV. Lack of adherence leads to cross-resistance to antiretroviral drugs. The computer model predicts that over time almost a third of the HIV-infected population may become cross-resistant to the drugs that are currently being prescribed. Ultimately drug resistance leads to failure of therapy and more rapid progression to AIDS and death.

In general, drug resistance represents the major obstacle to the long-term efficacy of antiretroviral therapy. One approach is "...to focus on making better therapies and longer-lasting formulations that are easier to use, more easily absorbed, have fewer side effects and drug interactions, and maintain more consistent drug levels in blood." (Project Inform Perspective, 1997). A second approach is to focus on behavioral factors that affect adherence. Studies indicate that a large proportion of HIV-infected patients fail to completely adhere to their medication schedules and that adherence lessens with the duration of treatment. Lack of adherence results from a number of factors such as lifestyle, established patterns of behavior, self-image, lack of knowledge, and living and work environments that are not conducive to therapy. Long-term adherence to HIV therapy requires major life-style changes. Success in modifying lifestyles in order to facilitate adherence to treatment regimes can be improved if the patient is assisted in maintaining social relations with non-professionals. One study found that HIV-infected individuals who maintained high levels of social interaction reported higher levels of adherence to medications, advice and instructions by care givers, and clinic appointments (Brown et al., 1998). Another study found that the use of automated telephone calls mixed with live counselor calls to provide support for patients with HIV/AIDS enhanced adherence (Byrd et al., 1998). These strategies are important supplements to the professional care provided by physicians.

Finally, the results of the survey suggest that complex new therapies for HIV are a challenge for physicians who treat patients. In the future, efforts to inform physicians of these therapies also need to focus on the complex issues of management of treatment in order to improve adherence.

Acknowledgment

Figure 1 and Table 3 are taken from Anderson and others (1998).

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